IBM IMS High Performance Image Copy for z/OS

User's Guide

4.2

SC19-2756-16

IBM

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Note:

Before using this information and the product it supports, read the information in "Notices" on page 522.

17th Edition

This edition applies to Version 4.2 of IBM® IMS High Performance Image Copy for z/OS® (program number 5655-N45) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC19-2756-15.

About this information

IBM® IMS High Performance Image Copy for z/OS® 4.2 (also referred to as IMS HP Image Copy) is an IMS Tools product that provides fast back up and recovery of database data sets using advanced copy technology.

These topics describe how to configure and use IMS HP Image Copy. IMS HP Image Copy creates an as-is image copy of a database and recovers a physically damaged data set of an IMS database.

This information is designed to help systems programmers and administrators perform the following tasks:

- Use the Image Copy, Recovery, and Create Image Copy functions
- Manage the data sets for these functions
- Reduce the number of HD and DEDB Pointer Checker jobs for verifying the pointers of image copies taken
- Invoke the Image Copy function in other IMS tools jobs
- Produce faster image copies with Advanced Image Copy Services
- Diagnose and recover from IMS HP Image Copy problems

To use these topics, you should have a working knowledge of:

- The z/OS® operating system
- ISPF
- SMP/E

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

https://www.ibm.com/support/pages/node/712955

The IMS Tools Product Documentation web page includes:

- Links to IBM® Documentation for the user guides ("HTML")
- PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Technical articles from IBM® Software Support
- White papers that describe product business scenarios and solutions

Introduction

The following topics introduce IBM® IMS High Performance Image Copy for z/OS® (also referred to as IMS HP Image Copy).

Topics:

- "IMS HP Image Copy overview" on page 8
- "IMS HP Image Copy features" on page 33

IMS HP Image Copy overview

IBM® IMS High Performance Image Copy for z/OS® (also referred to as IMS HP Image Copy) uses advanced copy technology and provides high-speed database copy and recovery features for the rapid backup and recovery of database data sets.

Image copies are essential to the timely recovery of databases after a loss of data or programming mistakes. However, taking the database offline to take image copies can reduce user productivity, have negative effect and impact on your business. IMS HP Image Copy helps you speed database backup and recovery time by supporting quick shots of image copies and restarting methods. As a result, you can help users become more productive and avoid expensive losses from missed business opportunities.

In addition to the database backup capability, IMS HP Image Copy supports many features. During the daily or weekly backup operations with IMS HP Image Copy, you can check the integrity of database pointers or collect and store database statistics to monitor the health of your databases. IMS HP Image Copy is a tool that helps you maintain and manage your IMS databases safely.

IMS HP Image Copy provides the following functions:

Image Copy function

Creates as-is image copies of database data sets. The function supports several image copy formats and many processing options for creating image copies. You can select and use the format and the options that best match your IMS environment and backup needs.

For example, you can create batch image copies or concurrent image copies. Batch image copies are created while no other applications are actively updating the database; a batch image copy is a clean copy of the database. Concurrent image copies can be created even when IMS or IMS applications are updating the database; a concurrent image copy is a fuzzy copy of the database.

You can also activate Advanced Image Copy Services, which uses the FlashCopy® capability of DASD, to create exact copies of IMS database data sets on the DASD with less time.

Recovery function

Recovers a physically damaged data set by using an image copy data set.

Create Image Copy function

Reads an image copy data set, and creates one or more copies of it.

The product supports the following two methods for invoking the Image Copy function and the Recovery function:

- Using a JCL stream for the FABJMAIN module, which is a module of IMS HP Image Copy. With this method, you can use all the functions and features of IMS HP Image Copy.
- Using a JCL stream that is written for the Database Image Copy utility (DFSUDMP0) or the Database Recovery utility (DFSURDB0). In this information, these JCL streams are referred to as *IMS compatible JCL*. You can invoke the functions of IMS HP Image Copy, except for the Create Image Copy function, by using the JCL stream that is prepared for those IMS standard utilities with a simple modification to the JCL. However, some features of IMS HP Image Copy cannot be used with this method.

Topics:

- "What's new in IMS HP Image Copy" on page 9
- "IMS HP Image Copy terminology" on page 16
- "IMS HP Image Copy features and benefits" on page 18
- "Data and process flow" on page 19

- “Format of image copy data sets” on page 26
- “Integration with other IMS tools” on page 28
- “Support for IBM IMS Tools Base” on page 29
- “Functional changes” on page 30
- “Service updates and support information” on page 31
- “Product documentation and updates” on page 31
- “Accessibility features” on page 32

What's new in IMS HP Image Copy

This topic summarizes the technical changes for this edition.

SC19-2756-16 (December 2025)

Table 1: SC19-2756-16 updates

Description	Related APARs
Image Copy function: Support for DEDBs with more than 2048 areas. Previously, the Image Copy function supported DEDBs with up to 2048 areas. This APAR enhances the Image Copy function to process DEDBs that contain more than 2048 areas, up to a maximum of 9999 areas. The following topics are updated: • “Restrictions for the Image Copy function” on page 72 • “AREA keyword” on page 163	PH68426

SC19-2756-15 (May 2025)

Table 2: SC19-2756-15 updates

Description	Related APARs
Documentation update. Added descriptions for return codes and reason codes in message FABJ3945E.	N/A

SC19-2756-14 (March 2025)

Table 3: SC19-2756-14 updates

Description	Related APARs
Added message FABJ3946E, which is issued only when the job runs in an IMS-managed ACBs environment to report the name of the DBD that could not be obtained.	PH65481

SC19-2756-13 (March 2023)

Table 4: SC19-2756-13 updates

Description	Related APARs
Added information about creating image copies of a HALDB and the IMS catalog to the following topics: • “Considerations for the Image Copy function” on page 69 • “Considerations for the Image Copy function (DFSUDMP0 JCL)” on page 321	N/A

SC19-2756-12 (January 2023)

Table 5: SC19-2756-12 updates

Description	Related APARs
Image Copy function: Enables HASH pointer check to run in an IMS-managed ACBs environment for Fast Path databases. The following topics are updated: • "Considerations for the Image Copy function" on page 69 • "Restrictions for the Image Copy function" on page 72	PH51029
Documentation updates. The following topics are updated: • "Considerations for the Image Copy function (DFSUDMP0 JCL)" on page 321 • "Restrictions for the Image Copy function (DFSUDMP0 JCL)" on page 322 • "IMS Database Reorganization Expert" on page 370	N/A

SC19-2756-11 (October 2022)

Table 6: SC19-2756-11 updates

Description	Related APARs
Image Copy function: The Image Copy function can wait and retry dynamic allocation of database data sets when they are already allocated by another application with the DISP=OLD option. The following topics are added or updated: • "Supported keywords for the Site Default Generation utility" on page 60 • "Control statement keywords for the Image Copy function" on page 90 • "Relation of keywords to ICEIN control statements" on page 158 • "DYNA_RETRY keyword" on page 185	PH49342

SC19-2756-10 (August 2022)

Table 7: SC19-2756-10 updates

Description	Related APARs
Image Copy function: Enables the HASH Pointer Check and Integrated DB Sensor to run in an IMS-managed ACBs environment for full-function databases. The following topics are updated: • "Considerations for the Image Copy function" on page 69 • "Restrictions for the Image Copy function" on page 72 • "Multiple-step HASH Check option reference" on page 102 • New messages: FABJ0452E, FABJ3975E, FABJ3976E, FABJ3977E	PH43078
Image Copy function: When FASTIC=(,DUMP) is applied, the Concurrent Image Copy (CIC) process retries to read CIs when CI or CA splits are detected. The following topics are updated or added: • "Batch image copy and concurrent image copy" on page 39 • New or modified messages: FABJ4245E, FABJ4255I	PM46198

SC19-2756-09 (July 2022)

Table 8: SC19-2756-09 updates

Description	Related APARs
Documentation updates to support IMS Administration Foundation, which activates the IMS administration web-browser interface of IBM® Unified Management Server for z/OS® to enable the management IMS systems and resources.	N/A

SC19-2756-08 (March 2022)

Table 9: SC19-2756-08 updates

Description	Related APARs
Image Copy function, Recovery function, Create Image Copy function (FABJMAIN program): You can specify default values for the following keywords by using the Site Default Generation utility: CAUNIT, DATACLAS, DATACLAS2, DATACLAS*n*, ICHLQ2, ICHLQ*n*, ICUNIT, LOGUNIT, MGMTCLAS, MGMTCLAS2, MGMTCLAS*n*, RETPD, RETPD2, RETPD*n*, SHDWMGMTCL, SHDWSTORCL, STORCLAS, STORCLAS2, STORCLAS*n*, TIMECHK The following topics are updated: • "Supported keywords for the Site Default Generation utility" on page 60 • "Relation of keywords to ICEIN control statements" on page 158 • "CAUNIT keyword" on page 165 • "DATACLAS keyword" on page 171, "DATACLAS2 keyword" on page 171, "DATACLASn keyword" on page 172 • "ICHLQ2 keyword" on page 204, "ICHLQn keyword" on page 205 • "ICUNIT keyword" on page 209 • "LOGUNIT keyword" on page 215 • "MGMTCLAS keyword" on page 217, "MGMTCLAS2 keyword" on page 217, "MGMTCLASn keyword" on page 218 • "RETPD keyword" on page 228, "RETPD2 keyword" on page 229, "RETPDn keyword" on page 230 • "SHDWMGMTCL keyword" on page 236 • "SHDWSTORCL keyword" on page 237 • "STORCLAS keyword" on page 244, "STORCLAS2 keyword" on page 244, "STORCLASn keyword" on page 245 • "TIMECHK keyword" on page 249	PH40355

SC19-2756-07 (November 2021)

Table 10: SC19-2756-07 updates

Description	Related APARs
Image Copy function: RECALL keyword support. The RECALL keyword recalls input database data sets if the input database data sets are migrated by DFSMShsm so that the Image Copy function can process the database data sets. The following topics are added or updated: • "Hardware and software prerequisites" on page 52 • "Supported keywords for the Site Default Generation utility" on page 60 • "Control statement keywords for the Image Copy function" on page 90 • "Relation of keywords to ICEIN control statements" on page 158 • "RECALL keyword" on page 225 • New messages: FABJ0404E, FABJ0405E, FABJ0406E	PH40359

SC19-2756-06 (October 2021)

Table 11: SC19-2756-06 updates

Description	Related APARs
Image Copy function and Recovery function: These functions can run in an IMS environment where the IMS management of ACBs is enabled. The following topics are added or updated: • "Considerations for the Image Copy function" on page 69 • "Restrictions for the Image Copy function" on page 72 • "DD statements for creating image copies" on page 83 • "Considerations for the Recovery function" on page 117 • "DD statements for the Recovery function" on page 118 • "Considerations for the Image Copy function (DFSUDMP0 JCL)" on page 321 • "Restrictions for the Image Copy function (DFSUDMP0 JCL)" on page 322 • "DD statements for the Image Copy function (DFSUDMP0 JCL)" on page 332 • "Considerations for the Recovery function (DFSURDB0 JCL)" on page 350 • "DD statements for the Recovery function (DFSURDB0 JCL)" on page 351 • New messages: FABJ0400I, FABJ3944E, FABJ3945E	PH40351

SC19-2756-05 (August 2021)

Table 12: SC19-2756-05 updates

Description	Related APARs
Image Copy function: The DUMP process of Advanced Image Copy Services does not support creating image copy data sets of database data sets that are allocated as extended format data sets. Restrictions and an error message are added to the following topics: • "Advanced Image Copy Services support" on page 37 • "Preparing for taking image copies" on page 75 > "Process type" on page 76 • New message: FABJ0316E	PH38959

Description	Related APARs
Recovery function: If the input image copy data set is created by the DUMP or the COPY process of Advanced Image Copy Services or the IMS Database Image Copy 2 utility (DFSUDMT0), the Recovery function cannot use that image copy data set to recover the database data set with different allocation attributes. The allocation attributes of the database data set must be the same as the original database data set. The following topics are updated: • "Restrictions for the Recovery function" on page 117 • "Considerations for the Create Image Copy function" on page 127 > "Logical copy and physical copy" on page 127	N/A

SC19-2756-04 (June 2021)

Table 13: SC19-2756-04 updates

Description	Related APARs
Messages FABJ0315E and FABJ0451E are added. Also, message FABJ0450E is modified.	PH32404 and PH31473
Support HISTORY option for DEDB Pointer Checker: Use the HISTORY option to record DEDB history data during DEDB HASH Check. For more information, see the following topics: • "DD statements for the DEDB HASH Check option" on page 89 • "DEDBPC keyword" on page 179	PH30776
Descriptions about time stamp recovery are added. See the following topics: • "TIMESTMP keyword" on page 250 • "Control statements for the Recovery function (DFSURDB0 JCL)" on page 353	N/A

SC19-2756-03 (July 2020)

Table 14: SC19-2756-03 updates

Description	Related APARs
Support for encrypted database data sets: Functions and features of IMS HP Image Copy support encrypted database data sets. For more information, see "Data set encryption support" on page 36 and "KEYLABEL keyword" on page 214.	PH12098, PH19075, PH21572, and PH25480
Option to group digits printed in HASH Check reports: Use the GROUPDIGITS keyword to enable or disable digit grouping for the numeric values printed in Database Statistics reports and Partition Statistics reports of HD Pointer Checker, which are generated by HASH Check. For more information, see "GROUPDIGITS keyword" on page 194.	PH10418
Option to stop all IMS image copy processes when an error occurs: Use the IC_ERROR keyword to terminate all image copy processes for all database data sets when an error occurs in one of the image copy processes. For more information, see "IC_ERROR keyword" on page 210.	PH09623
Wildcard support for the DBD and PART keywords of the Image Copy function: The DBD keyword and the PART keyword of the Image Copy function support wildcard characters. For more information, see "DBD keyword" on page 175 and "PART keyword" on page 224.	PH06305
&GROUP symbolic parameter support for IMS Database Recovery Facility: The data set naming template support symbolic parameter &GROUP for the DBRC group name. For more information, see "Data set naming template" on page 283.	PI78538

Description	Related APARs
Support Fast Recovery image copy format for IMS Online Reorganization Facility: Image Copy jobs invoked by IMS Online Reorganization can create image copies in Fast Recovery image copy format. For more information, see "IMS Online Reorganization Facility" on page 377.	PI63757
Support for EMC TimeFinder: The Create Image Copy function supports EMC TimeFinder as the data mover utility. For more information, see "DATA_MOVER keyword" on page 173.	PI69169
Changes to the default values of the number of parallel Image Copy tasks: The default values for the number of tasks that can run in parallel in Image Copy jobs have changed. For more information, see the following topics: • "GRPLIM keyword" on page 194 • "SHDWTCTL keyword" on page 237 • "TASKCTL keyword" on page 246	PI71145
Support for the large block interface: This APAR enhanced the Image Copy function to: • Support the large block interface (LBI). See "LBI keyword" on page 215. • Change the handling of Fast Path secondary indexes. See "Considerations for Fast Path secondary indexes" on page 71.	PI95184

SC19-2756-02 (September 2016)

Table 15: SC19-2756-02 updates

Description	Related APARs
Support alias for the TOIXCFGR keyword: • The new TOSIXCFGRP keyword is an alias for the TOIXCFGR keyword and it functions identically to the TOIXCFGR keyword. • The new (HPIC) statement parameter, STACMDFAIL, is supported for the HPSRETCD control statement for return code handling. For more information, see "TOSIXCFGRP keyword" on page 260 and "HPSRETCD control statement" on page 270.	PM54604
Support for up to 2048 ICEIN DD statements: You can specify up to 2048 ICEIN DD statements when you use the Image Copy function or the Create Image Copy function.	PM60451
Support deletion of incomplete output image copy data sets: The new DEL_ICDS keyword deletes the image copy data set of the database data set when errors occur in the image copy process for the database data set. For more information, see "DEL_ICDS keyword" on page 180.	PM68259
Support ICDALLOC keyword for the Site Default Generation utility: The default value of ICDALLOC keyword can be changed by using the Site Default Generation utility. For more information, see "Setting default values for the FABJMAIN program" on page 58.	PM71579
Restrict reuse of output image copy data sets: The new NOREUSE keyword restricts the reuse of image copy data sets that are cataloged in the system. For more information, see "NOREUSE keyword" on page 219.	PM76650
Store messages in the DFSPRINT data set in the IMS Tools Knowledge Base Output repository: Messages that are written to the DFSPRINT data set can now be stored in the Output repository of IMS Tools Knowledge Base.	PM77057
IMS 13.1 support: IMS HP Image Copy supports IMS 13.1.	PM75253
Switch from the batch image copy process to the concurrent image copy process: The new FALLBACK keyword requests to switch from the batch image copy process to the concurrent image copy process when exclusive authorization is not granted. For more information, see "FALLBACK keyword" on page 189.	PM84891

Description	Related APARs
Site Default Generation utility enhancement to support IMS compatible JCL: The Site Default Generation utility can now generate the site default table for use with IMS compatible JCL streams. You can set default values and have them applied when you run IMS HP Image Copy functions with IMS compatible JCL. For more information, see “Setting default values (IMS compatible JCL)” on page 357.	PM90276
IMS /START command support for offline databases: IMS HP Image Copy can issue, through the IMS Tools Online System Interface, the /START command to start the offline database, partition, or area. With this option, you can start IMS applications immediately after the database is initialized or reorganized. For more information, see “TOIAUTO_STA keyword” on page 256.	PI20067
EMC TimeFinder support for Advanced Image Copy Services: The new DATA_MOVER keyword requests to use the EMC TimeFinder for the COPY and the FDUMP processes of Advanced Image Copy Services. For more information, see “DATA_MOVER keyword” on page 173.	PI47936
Advanced Image Copy Services enhancement to support IMS Online Reorganization Facility: Advanced Image Copy Services is enhanced to support IMS Online Reorganization Facility. You can create image copies in Fast Recovery image copy format in IMS Online Reorganization Facility jobs. For more information, see “IMS Online Reorganization Facility” on page 377.	PI63757
Support ICOUT=%NO parameter for FASTIC=N or FASTIC=(,DUMP): Before this enhancement, ICOUT=%NO, which specifies to create no image copy data sets, can only be used when the FASTIC keyword specifies (*opt*,FDUMP) or (*opt*,COPY). After this APAR is applied, you can also use ICOUT=%NO when FASTIC=N or FASTIC=(*opt*,DUMP).	PI66117

SC19-2756-01

Table 16: SC19-2756-01 updates

Description	Related APARs
IMS GLOBAL keyword support: You can use the TOIAUTO keyword to control whether to issue the IMS commands for all online subsystems that share the database. See “TOIAUTO keyword” on page 252.	PM10319 and PM12249
IMS Fast Path Online Tools support: You can call the Image Copy function within IMS Fast Path Online Tools jobs of IMS Fast Path Solution Pack for z/OS®. See “IMS HP Fast Path Utilities” on page 374.	PM11511
Online Pointer Checking function support: By using the Online Pointer Checking function, you can run a HASH pointer check without creating image copies. See “Pointer checking online full-function databases” on page 141.	PM15237
FASTIC and DBALL keyword enhancements: This APAR adds the following enhancements: • You can specify the Image Copy function to run with the FCTOPPRCPrimary option of the DFSMSdss COPY command. See “FASTIC keyword” on page 190. • You can specify the Image Copy function to process only the DBDSs that are logically related. See “DBALL keyword” on page 173.	PM28291
IMS Tools KB support in IMS Online Reorganization Facility jobs: You can store the IMS HP Image Copy reports and IMS HP Pointer Checker reports that are generated in IMS Online Reorganization Facility jobs in the IMS Tools KB Output repository. See “Central management of reports” on page 38.	PM28407
DB Sensor support: By using the Integrated DB Sensor, you can collect statistics from databases while the Image Copy function is run and store the statistics in the IMS Tools KB Sensor Data repository. See “Collect sensor data with Integrated DB Sensor” on page 44.	PM50159

Description	Related APARs
The following fixes and changes were made: • The BYPDBAUTH keyword was added to bypass DBRC database authorization for index databases that are processed with the VIC=Y option. • You can create up to four image copy data sets for one DBDS or an area. • The default value for the I/O buffer of the image copy data set was changed to 50. • The size of the checkpoint file (used for the Checkpoint Restart function) was reduced. • The CIC_KSDS keyword was added to prevent a concurrent image copy from being created if the database is KSDS. • IMS HP Image Copy retries the DFSMSdss DUMP command process under certain conditions.	PM34344, PM40738, PM45137, and PM46198

IMS HP Image Copy terminology

There are several unique terms that you must understand before you begin to use IMS HP Image Copy.

Subtopics:

- "Unique terms used in this information" on page 16
- "Short names used in this information" on page 17

Unique terms used in this information

Advanced Image Copy Services

Refers to a set of services that IMS HP Image Copy provides. These services use the DFSMSdss cross-memory application programming interface (API) to enable fast image copy.

Compressed image copy format

Refers to a format of image copy data sets. Image copy data sets in this format are compressed by one of IMS HP Image Copy compression routines.

Database Sensor or DB Sensor

Refers to the Database Sensor function, which collects sensor data from databases and stores them in the Sensor Data repository of IMS Tools Knowledge Base.

This function is provided by IMS Database Solution Pack and IMS Database Utility Solution for full-function databases, and by IMS Fast Path Solution Pack for DEDBs.

DEDB

Refers to a Data Entry Database.

DEDB HASH Check

Refers to the database pointer check function for DEDB areas. This function is provided by the DEDB Pointer Checker utility of IMS Fast Path Solution Pack.

DFSMSdss Advanced Copy Services

Refers to Advanced Copy Services of DFSMSdss.

Fast Recovery image copy format

Refers to a format of image copy data sets. Image copy data sets in this format are created by the COPY option of Advanced Image Copy Services, and enable fast recovery of database data sets.

HALDB

Refers to a High Availability Large Database.

IMS compatible JCL

Refers to JCL streams that are set up to run the IMS Image Copy utility (DFSUDMP0) or the IMS Database Recovery utility (DFSURDB0). These utilities have alias names that correspond to an IMS utility.

IMS image copy format

Refers to a format of image copy data sets. Image copy data sets in this format use the same format as the format of output data sets generated by the IMS Image Copy utility (DFSUDMP0).

Multiple-step HASH Check

Refers to the database pointer check function for full-function databases. This function is provided by HD Pointer Checker of IMS HP Pointer Checker. Multiple-step HASH Check option must be run in three steps, but it can evaluate the HASH records for several database data sets in one job step.

Single-step HASH Check

Refers to the database pointer check function for full-function databases. This function is provided by HD Pointer Checker of IMS HP Pointer Checker. Single-step HASH Check option can be run, in a single step, within an image copy job.

Standard image copy format

Generic term for image copies in IMS image copy format and compressed image copy format.

Short names used in this information

To make this information easier to read, the version and release levels of IMS are abbreviated, as follows:

IMS 15

Refers to IMS 15.1 and later, and IMS Database Value Unit Edition 15.1 and later.

The various versions of IMS are referred to simply as IMS, except where distinctions among them need to be made.

In this information, the following abbreviations are used.

Table 17: Short names for products

Short name	Product name
Autonomics Director	Autonomics Director provided by IBM® IMS Tools Base for z/OS® 1.7 or later (5655-V93)
IMS Database Reorganization Expert	IBM® IMS Database Reorganization Expert for z/OS® 4.1 (5655-S35)
IMS Database Solution Pack	IBM® IMS Database Solution Pack for z/OS® 2.2 (5655-DSP) or later
IMS Database Utility Solution	IBM® IMS Database Utility Solution for z/OS® 2.1 (5698-DUL) or later
IMS Fast Path Solution Pack	IBM® IMS Fast Path Solution Pack for z/OS® 2.1 (5698-FPP) or later
IMS HP Fast Path Utilities	IMS High Performance Fast Path Utilities provided by IBM® IMS Fast Path Solution Pack for z/OS®
IMS HP Image Copy	IBM® IMS High Performance Image Copy for z/OS® 4.2 (this product)
IMS HP Pointer Checker	IBM® IMS High Performance Pointer Checker for z/OS® 3.1 (5655-U09)
IMS Index Builder	IBM® IMS Index Builder for z/OS® 3.1 (5655-R01)
IMS Recovery Solution Pack	IBM® IMS Recovery Solution Pack for z/OS® 2.1 (5655-ISR) or later
IMS Tools Base	IBM® IMS Tools Base for z/OS® 1.7 (5655-V93) or later
IMS Tools Knowledge Base or IMS Tools KB	IMS Tools Knowledge Base provided by IBM® IMS Tools Base for z/OS®
IMS Tools Online System Interface or IMS TOSI	IMS Tools Online System Interface provided by IBM® IMS Tools Base for z/OS®

Table 18: Short names for functions, utilities, and components

Short name	Function, utility, and component name
DB Sensor	Database Sensor component of IMS Database Solution Pack, IMS Database Utility Solution, or IMS Fast Path Solution Pack
DEDB Pointer Checker	DEDB Pointer Checker utility of IMS HP Fast Path Utilities
DFSMSdss	Data Set Services (DFSMSdss™) of DFSMS™ (Data Facility Storage Management Subsystem)
HD Pointer Checker	HD Pointer Checker utility of IMS HP Pointer Checker

Short name	Function, utility, and component name
IMS Database Recovery Facility or IMS DRF	IMS Database Recovery Facility in IBM® IMS Recovery Solution Pack for z/OS®
IMS Fast Path Advanced Tool	IMS Fast Path Advanced Tool of IMS HP Fast Path Utilities
IMS Fast Path Basic Tools	IMS Fast Path Basic Tools of IMS HP Fast Path Utilities
IMS Fast Path Online Tools	IMS Fast Path Online Tools of IMS HP Fast Path Utilities
IMS HALDB Toolkit	IMS HALDB Toolkit of IMS Database Solution Pack or IMS Database Utility Solution
Index Builder	Index Builder function of IMS Index Builder
IMS Online Reorganization Facility	IMS Online Reorganization Facility of IBM® IMS Database Solution Pack for z/OS®
Output repository	Output repository of IMS Tools KB
Parallel Reorganization Service	Parallel Reorganization Service of IMS Database Reorganization Expert
Sensor Data repository	Sensor Data repository of IMS Tools KB
Smart Reorg	Smart Reorg utility of IMS Database Reorganization Expert

IMS HP Image Copy features and benefits

IMS HP Image Copy provides many significant features that simplify your database backup and recovery tasks.

- Reduces running time by creating image copies for more than one database data set or area data set in parallel.
- Enables you to set default values for the runtime environment.
- Reduces the manual labor that is required for specifying DD cards and keeping consistency with DBRC by supporting dynamic allocation of IMS database data sets and image copy data sets.
- Reduces the manual labor that is required for controlling output image copy data sets by using the naming template.
- Reduces the amount of time a database is unavailable during image copy and recovery by leveraging FlashCopy®, SnapShot Copy, and Concurrent Copy technologies.
- Minimizes CPU utilization and elapsed time by using High Performance (HP) Input/Output for read and write processing.
- Reduces the need to manually stop and start databases by interfacing with the IMS Tools Online System Interface.
- By stacking the output of the Image Copy function, decreases the number of tape volumes that are used and reduces operational costs.
- Reduces the manual labor that is required to ensure the accuracy of pointers in image copies by running database pointer check function of IMS HP Pointer Checker or of IMS HP Fast Path Utilities within the image copy job.
- Reduces the manual labor that is required for tape mounting and unmounting, thus reducing the processing of the HD Pointer Checker and DEDB Pointer Checker functions for the image copy data sets.
- Decreases the need for job control language handling when restarting by running automatic checkpoint/restart.
- By integrating with IMS Tools Base IMS Tools Knowledge Base, stores IMS HP Image Copy reports in a centrally managed repository.
- Enables you to view IMS HP Image Copy reports through the graphical web interface that is provided by IBM® IMS Administration Foundation for z/OS®, which is activated on top of IBM® Unified Management Server for z/OS®.
- Collects database statistics (sensor data) and stores them in a central repository for use with other IMS tools or products.

- Works with the following IMS Tools product functions and creates image copy data sets:
  - IMS Database Recovery Facility of IMS Recovery Solution Pack
  - IMS High Performance Fast Path Utilities of IMS Fast Path Solution Pack
  - Smart Reorg utility of IMS Database Reorganization Expert
  - IMS Online Reorganization Facility of IMS Database Solution Pack
  - IMS HALDB Toolkit of IMS Database Solution Pack or IMS Database Utility Solution

Data and process flow

The Image Copy function of IMS HP Image Copy reads data from the IMS database and creates image copies. The function supports many features that facilitate creating image copies and monitoring database health.

For example, while IMS HP Image Copy creates image copies, it can start HASH Check to check the pointers in the database. It can also call the Integrated DB Sensor function to collect sensor data from the database and store it in the repository of IMS Tools Knowledge Base. IMS HP Image Copy can also request to stop and restart or quiesce and release the quiesce state of the database through IMS Tools Online System Interface.

The following figure illustrates the data flow of the Image Copy function in a configuration where these functions and the interface are used.

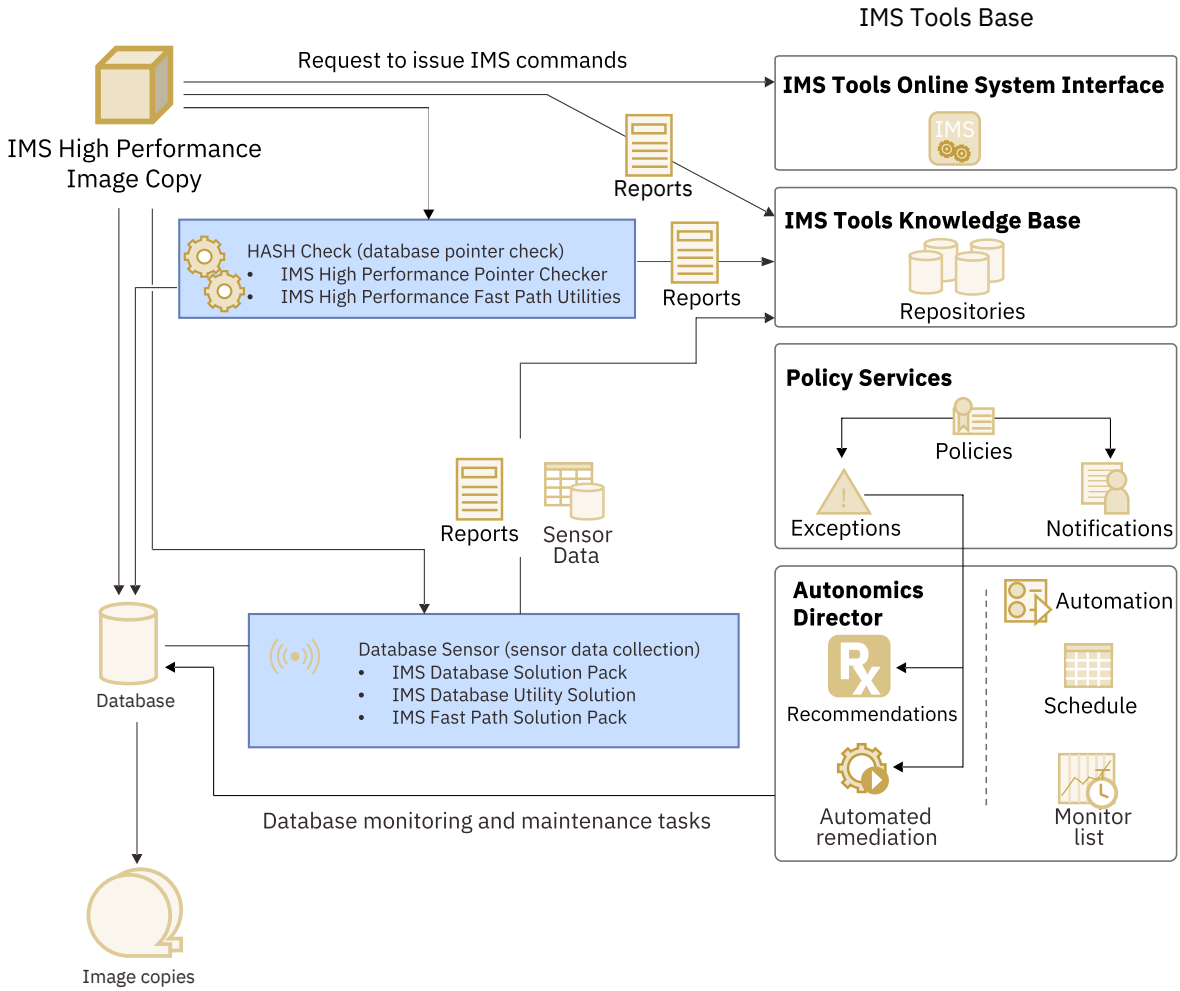


Figure 1: Data flow of the Image Copy function

In the following topics, review the high-level process flow to learn how the IMS HP Image Copy functions work to create or recover database data sets.

Process flow of the Image Copy function

The following subtopics explain the flow of the Image Copy function processes.

Subtopics:

- "Image copy process" on page 20
- "Image copy process with Advanced Image Copy Services" on page 21
- "Image copy process with single-step HASH Check option" on page 22
- "Image copy process with multiple-step HASH Check option" on page 23
- "Image copy process with DEDB HASH Check option" on page 24

Image copy process

The following diagram shows the process flow of the Image Copy function.

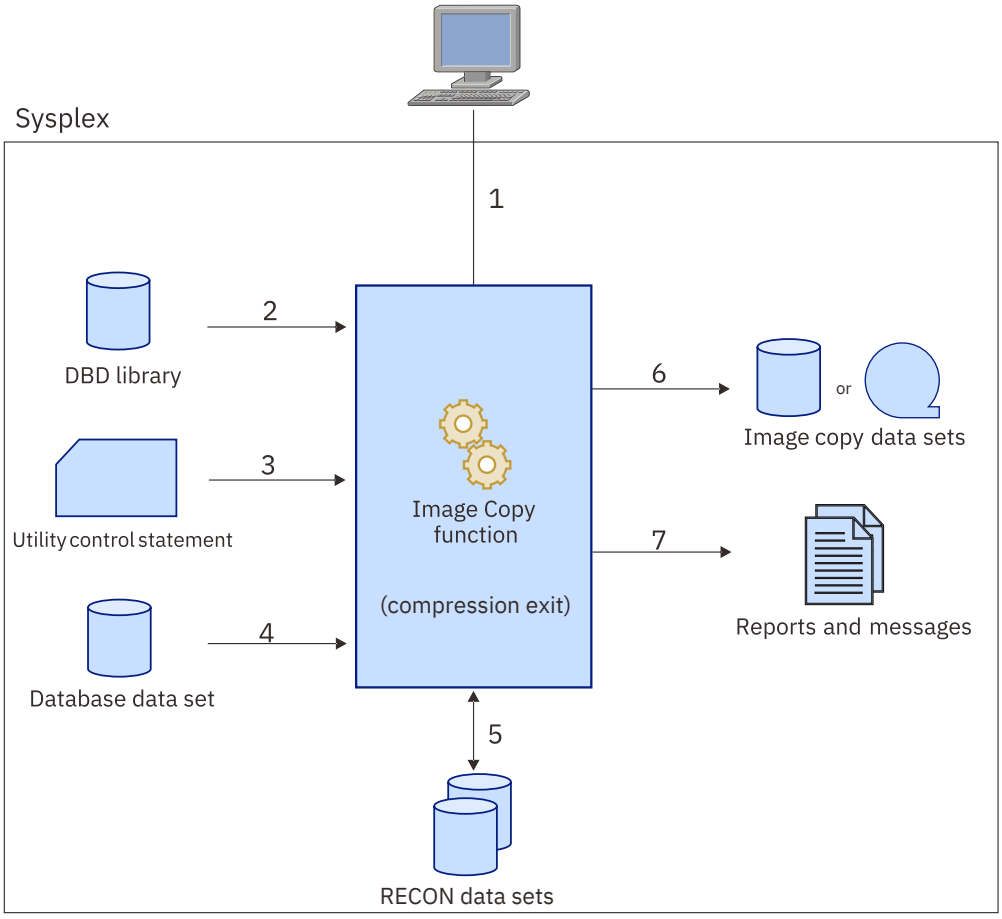


Figure 2: Process flow of the Image Copy function

The process steps match the numbers in the diagram:

1. User submits the IMS HP Image Copy JCL that specifies the Image Copy function to run.
2. The Image Copy function reads the DBD library that describes the database data set.
3. The Image Copy function reads the utility control statements and determines the process.
4. The Image Copy function reads the database data set.
5. (Optional) The Image Copy function checks the DBRC RECON data sets.
6. The Image Copy function creates one or more image copy data sets (compressed if specified as such in the utility control statements.)
7. The Image Copy function generates outputs that include image copy processing messages, Image Copy Statistics report, DBRC Status report, and optionally, image copy record in the DBRC RECON data sets.

Image copy process with Advanced Image Copy Services

The following diagram shows the process flow for creating image copies with the COPY or the FDUMP option of Advanced Image Copy Services.

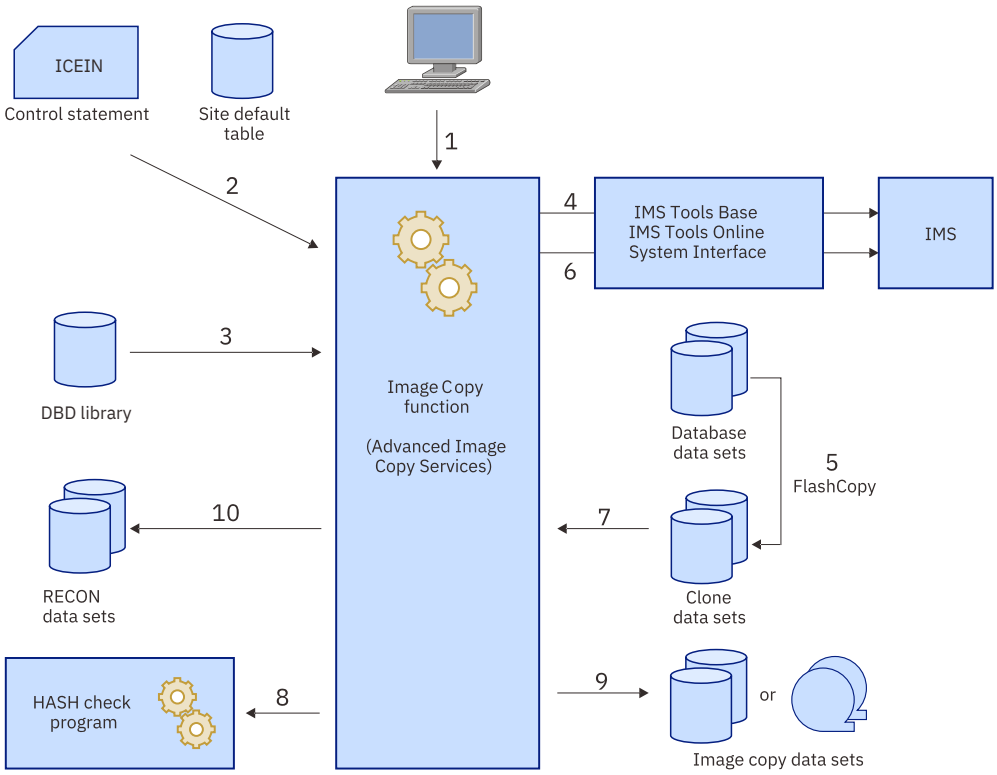


Figure 3: Process flow: Image Copy function with Advanced Image Copy Services

The process steps match the numbers in the diagram:

1. User submits the IMS HP Image Copy JCL that specifies to use Advanced Image Copy Services.
2. IMS HP Image Copy reads the site default table and ICEIN control statements.
3. IMS HP Image Copy reads the DBD library and DBRC RECON data sets. These resources contain information about the input database data sets and their status.
4. Through IMS Tools Online System Interface, IMS HP Image Copy issues IMS commands to prevent transactions and programs from updating the database.
5. IMS HP Image Copy creates clones of database data sets by using FlashCopy® of Advanced Image Copy Services.
   - If the COPY option is used, the clone data sets become the output image copy data sets.
   - If the FDUMP option is used, the clone data sets are shadow data sets.
6. Through IMS Tools Online System Interface, IMS HP Image Copy issues IMS commands to bring back the database online. IMS releases the database data sets, and transactions and programs can update the database.
7. IMS HP Image Copy reads database records from the clone data sets that were created in step “5” on page 21.
8. IMS HP Image Copy passes data to the HASH Check program.
9. If the FDUMP option is specified in the JCL, IMS HP Image Copy creates image copy data sets in standard image copy format.
10. IMS HP Image Copy registers the image copy data sets to the DBRC RECON data sets.

Image copy process with single-step HASH Check option

The Image Copy function can run HD Pointer Checker HASH Check while it creates an image copy. If you request HASH Check, you need only to take image copies instead of running the HD Pointer Checker utility to verify the pointers of databases. Thus, you can reduce the number of HD Pointer Checker jobs for verifying the pointers of image copies just taken.

To activate the HD Pointer Checker single-step HASH Check option while creating the image copy, run program FABJMAIN enabling the HASH Check option. Both Image Copy and HASH Check processes are run in a single step.

The following diagram shows the process flow of HD Pointer Checker single-step HASH Check within an image copy job of IMS HP Image Copy.

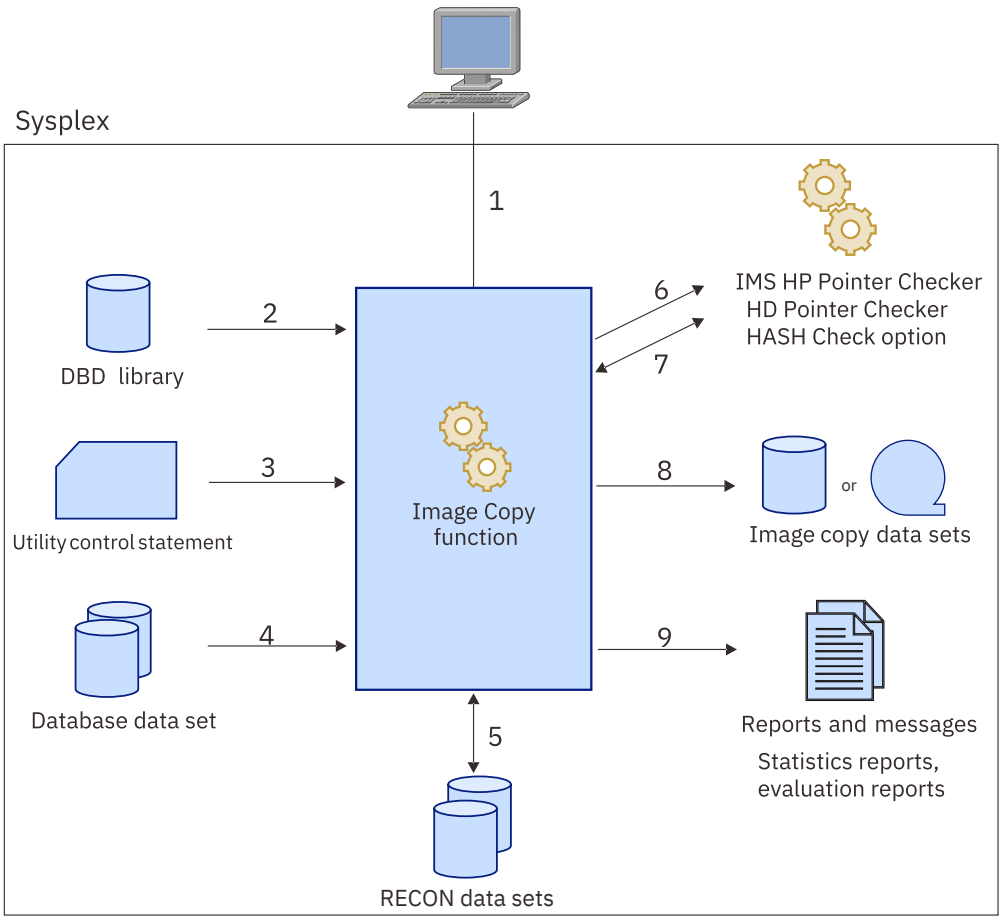


Figure 4: Process flow: Image Copy function with HD Pointer Checker HASH Check

The process steps match the numbers in the diagram:

1. User submits the IMS HP Image Copy JCL that specifies the Image Copy function to run with the single-step HASH Check option.
2. The Image Copy function reads the DBD library that describes the database data set.
3. The Image Copy function reads the utility control statements and determines the image copy process and the HASH Check process.
4. The Image Copy function reads the database data set to take image copies.
5. (Optional) The Image Copy function checks the DBRC RECON data sets.
6. The Image Copy function invokes the HASH Check function of HD Pointer Checker.
7. The HASH Check function checks the database pointers.
8. The Image Copy function creates one or more image copy data sets.

9. The Image Copy function and the HASH Check function generate outputs that include Image Copy Statistics report and HD Pointer Checker reports.

Image copy process with multiple-step HASH Check option

With multiple-step HASH Check, the Image Copy function calls the HD Pointer Checker HASH Check process after the image copy is created. This option is useful if you have many data sets to create image copies because the HASH Check can be done to all the data sets within one job step.

The multiple-step HASH Check option needs to be done in three steps:

1. Run the DBD Analysis program.
2. Run the Image Copy function with the HASH Check option.
3. Run the HASH Evaluation program.

The following diagram shows the process flow of using the HD Pointer Checker multiple-step HASH Check option with IMS HP Image Copy.

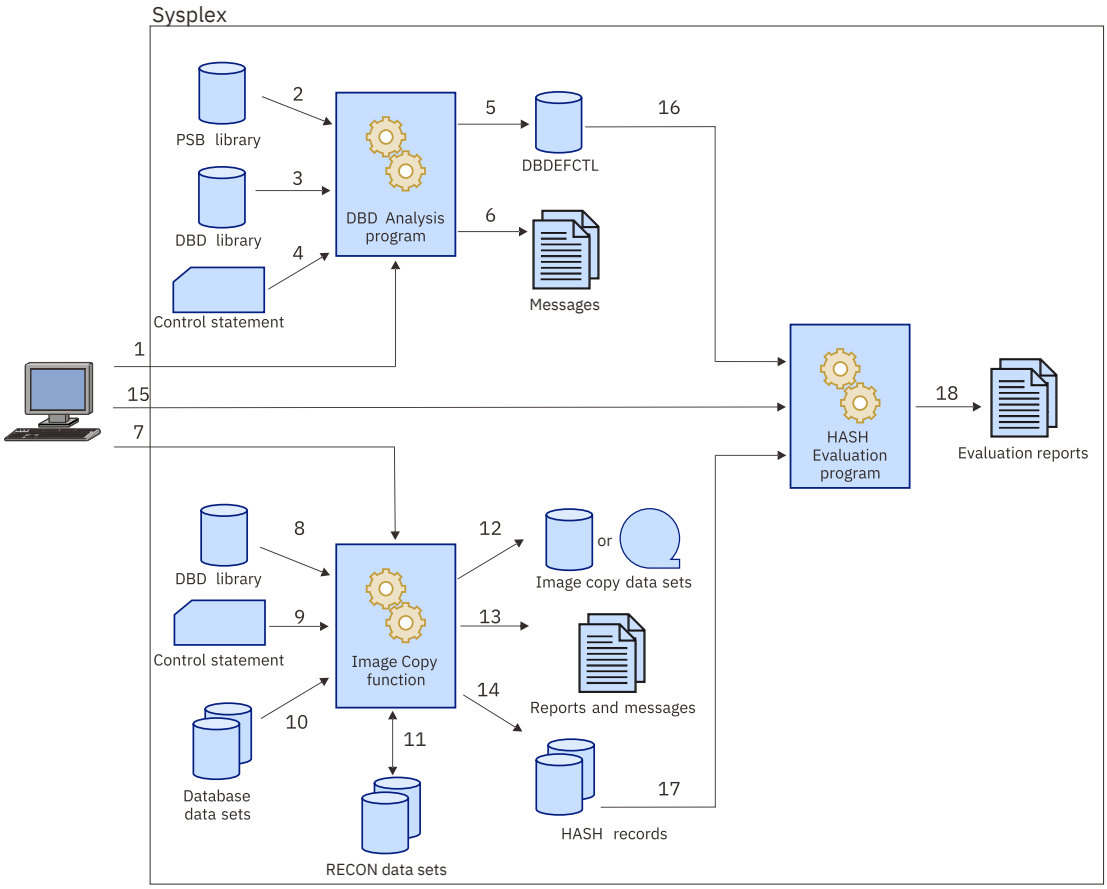


Figure 5: Process flow: Image Copy function with full-function database multiple-step HASH Check

The process steps match the numbers in the diagram:

1. User submits the DBD Analysis program JCL.
2. The DBD Analysis program reads the PSB library.
3. The DBD Analysis program reads the DBD library.
4. The DBD Analysis program reads the control statement and determines the process.
5. The DBD Analysis program generates the DBDEFCTL data set.
6. The DBD Analysis program issues notification messages.
7. User submits the IMS HP Image Copy JCL that specifies the Image Copy function to run.
8. The Image Copy function reads the DBD library.

9. The Image Copy function reads the utility control statements and determines the image copy process.
10. The Image Copy function reads the database data sets to take image copies.
11. (Optional) The Image Copy function checks the DBRC RECON data sets.
12. The Image Copy function creates one or more image copy data sets.
13. The Image Copy function generates the reports and messages.
14. The Image Copy function generates the HASH records.
15. User submits the HASH Evaluation program JCL.
16. The HASH Evaluation program reads the DBDEFCTL data set that was created by the DBD Analysis program.
17. The HASH Evaluation program reads the HASH records.
18. The HASH Evaluation program generates the Evaluation reports.

Image copy process with DEDB HASH Check option

The Image Copy function can run DEDB Pointer Checker HASH Check while it creates an image copy. If you request HASH Check, you need only to take image copies instead of running DEDB Pointer Checker to verify the pointers of databases. Thus, you can reduce the number of DEDB Pointer Checker jobs for verifying the pointers of image copies just taken.

The following diagram shows the process flow of the DEDB HASH Check option within an image copy job of IMS HP Image Copy.

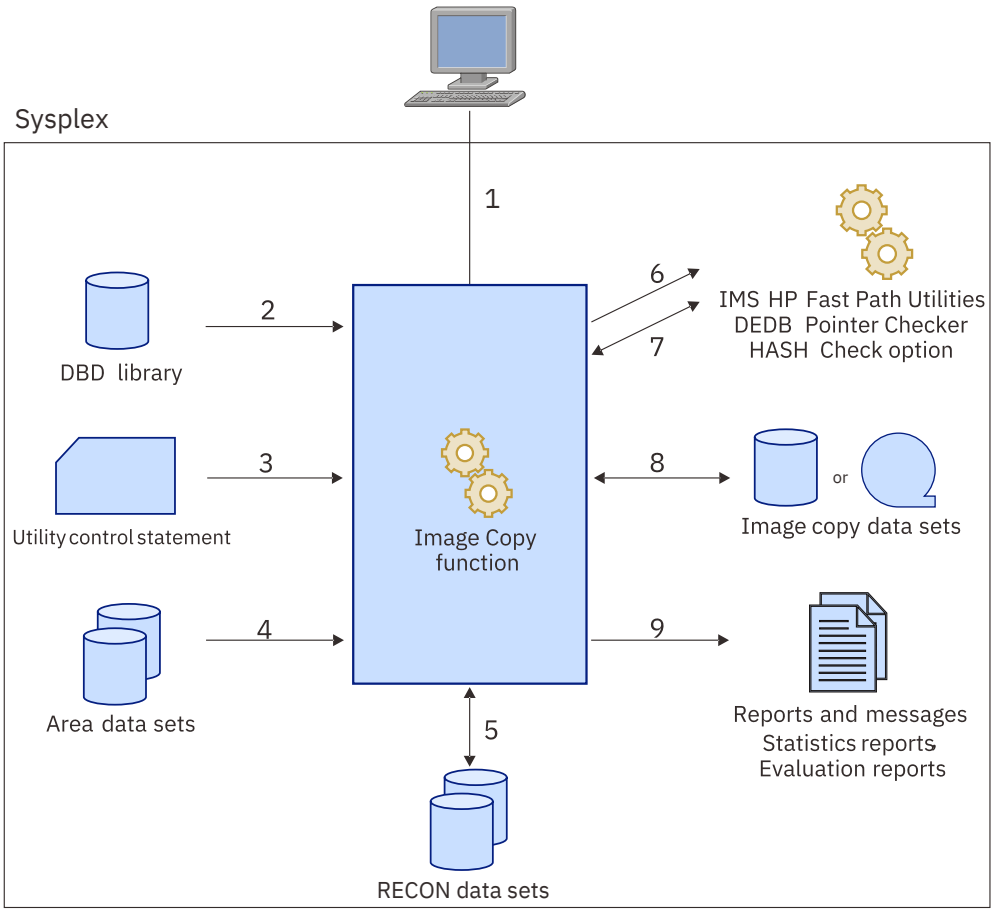


Figure 6: Process flow: Image Copy function with DEDB HASH Check

The process steps match the numbers in the diagram:

1. User submits the IMS HP Image Copy JCL that specifies the Image Copy function to run with the DEDB HASH Check option.
2. The Image Copy function reads the DBD library that describes the database data set.

3. The Image Copy function reads the utility control statements and determines the image copy process and the HASH Check process.
4. The Image Copy function reads the area data set to take image copies.
5. (Optional) The Image Copy function checks the DBRC RECON data sets.
6. The Image Copy function invokes the HASH Check function of DEDB Pointer Checker.
7. The HASH Check function checks the database pointers.
8. The Image Copy function creates one or more image copy data sets.
9. The Image Copy function and the HASH Check function generate outputs that include image copy processing messages, Image Copy Statistics report, and DEDB HASH Evaluation reports.

Process flow of the Recovery function

The following diagram shows the process flow of the Recovery function.

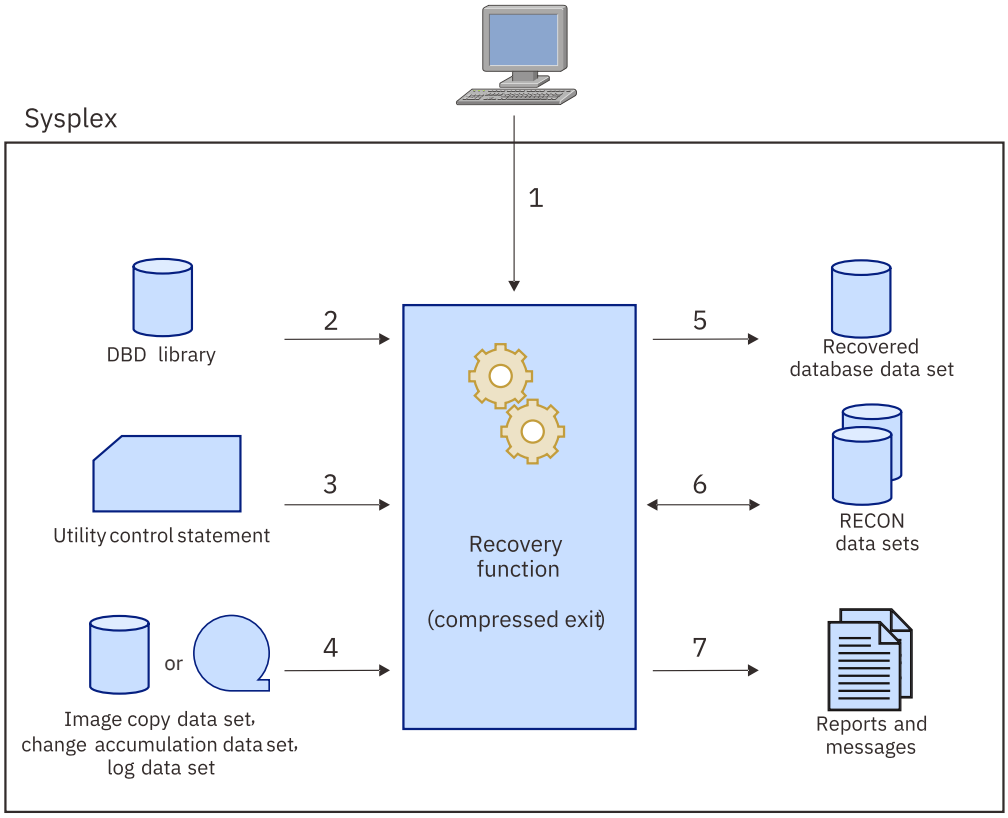


Figure 7: Process flow: Recovery function

The process steps match the numbers in the diagram:

1. User submits recovery JCL.
2. The Recovery function reads the DBD library that describes the database data set.
3. The Recovery function reads the utility control statements and determines the process.
4. The Recovery function reads the image copy data set. The input can be an image copy data set, change accumulation data set, or log data set.
5. The Recovery function recovers the corrupted database data set.
6. (Optional) The Recovery function checks the DBRC RECON data sets.
7. The Recovery function generates outputs. The outputs include recovery processing messages, Recovery Statistics report, and DBRC RECON data sets (optional).

Process flow of the Create Image Copy function

The following diagram shows the process flow of the Create Image Copy function.

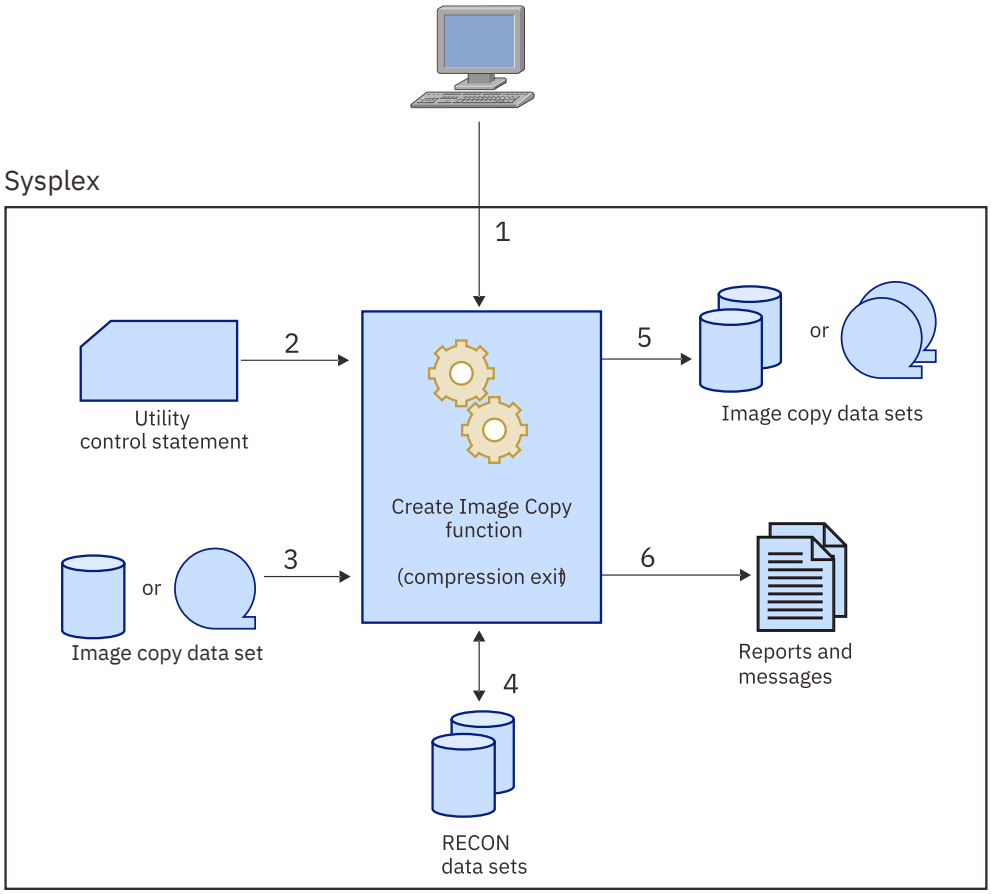


Figure 8: Process flow: Create Image Copy function

The process steps match the numbers in the diagram:

1. User submits a create image copy JCL.
2. The Create Image Copy function reads the utility control statements and determines the create image copy process.
3. The Create Image Copy function reads the input image copy data set to create new image copies.
4. (Optional) The Create Image Copy function checks the DBRC RECON data set.
5. The Create Image Copy function creates one or more image copy data sets.
6. The Create Image Copy function generates outputs. The outputs include Create Image Copy Statistics report, DBRC Status report, and optionally, Image Copy record in DBRC RECON data set.

Format of image copy data sets

IMS HP Image Copy supports several formats for image copy data sets.

The Image Copy function creates image copy data sets in one of the following formats:

- Standard image copy
  - IMS image copy
  - Compressed image copy
- Fast Recovery image copy

You can use image copy data sets created by IMS HP Image Copy jobs as an input to Recovery function jobs and Create Image Copy function jobs.

The Recovery function also supports the following image copy data set formats, which can be created by standard IMS utilities:

- IC2 image copy, which is created by the Database Image Copy 2 utility (DFSUDMT0)
- Online image copy, which is created by the Online Database Image Copy utility (DFSUICP0)

By using the Create Image Copy function with the CRCTYPE keyword, you can change the format of image copies between IMS image copy and compressed image copy. You can also change the format from Fast Recovery image copy to IMS image copy or to compressed image copy.

In this information, IMS image copy and compressed image copy are referred to as *standard image copy format* of IMS HP Image Copy.

The following table summarizes the formats of image copy data sets that can be created with IMS HP Image Copy.

Table 19: Format of image copy data sets

Format	Standard image copy process	Advanced Image Copy Services process				IMS compatible JCL
		FASTIC DUMP	FASTIC FDUMP	FASTIC COPY	Offload of FASTIC COPY Note	
Standard image copy format	Yes	Yes	Yes	No	Yes	Yes
Fast Recovery image copy format	No	No	No	Yes	Yes	No

Note: Offload copy creates secondary image copy data sets in the FASTIC COPY process of Advanced Image Copy Services. The format of the primary image copy data set is always Fast Recovery image copy.

Standard image copy

An image copy in standard image copy format can be either an *IMS image copy* or a *compressed image copy*.

IMS image copy

An IMS image copy is a copy of a database or area that reflects the state of the data at a point when no updates were being made.

Image copies can be created in IMS image copy format by the Database Image Copy utility (DFSUDMP0), IMS HP Fast Path Utilities, and IMS HP Image Copy. IMS image copies can be used for recovery purpose with IMS HP Image Copy, IMS Database Recovery Facility, and Database Recovery utility (DFSURDB0).

With IMS HP Image Copy, you can create image copy data sets in IMS image copy format by using the following image copy functions:

- The standard image copy process
- The FASTIC DUMP process of Advanced Image Copy Services
- The FASTIC FDUMP process of Advanced Image Copy Services
- Offload copy of the FASTIC COPY process of Advanced Image Copy Services. (Image copies in IMS image copy format are created as secondary image copy data sets.)
- IMS compatible JCL

Compressed image copy

A compressed image copy has the format of database records that are compressed by one of the IMS HP Image Copy compression routines. The advantage of this format is that it reduces allocation space for output image copies.

The functions of IMS HP Image Copy support the data sets that are in compressed format. Compressed image copies reduce the number of tapes that are needed to record the image copies.

The Image Copy function can generate image copies in compressed format. When image copies are compressed, you can decompress them by specifying the image copy as input for the Recovery function for a database recovery job or by specifying the image copy as input for the Create Image Copy function to create new image copy data sets.

Fast Recovery image copy

A Fast Recovery image copy helps you recover database data sets quickly, reducing the total recovery time and the time that the database is unavailable. You can create image copies in this format by activating the COPY process of Advanced Image Copy Services.

The format is different from the batch image copy or the compressed image copy in that the Fast Recovery image copy is an exact replica of the source database data set and the internal format and external data set characteristics duplicate those of the source data set. If the database data set is a VSAM ESDS, the generated Fast Recovery image copy data set is also VSAM. The only difference between the source and the target data sets is the external (image copy) data set name.

This image copy must reside on DASD and must be cataloged. It cannot reside on a tape nor be stacked with other image copies. When you specify the DD statement for the output image copy data set, the same data set organization as that of the input database must be specified.

For Fast Recovery image copies, the compression feature is not supported.

To create image copy data sets in Fast Recovery image copy format, use the FASTIC COPY process of Advanced Image Copy Services. You can do so by specifying COPY for the second parameter of the FASTIC keyword on the ICEIN control statement.

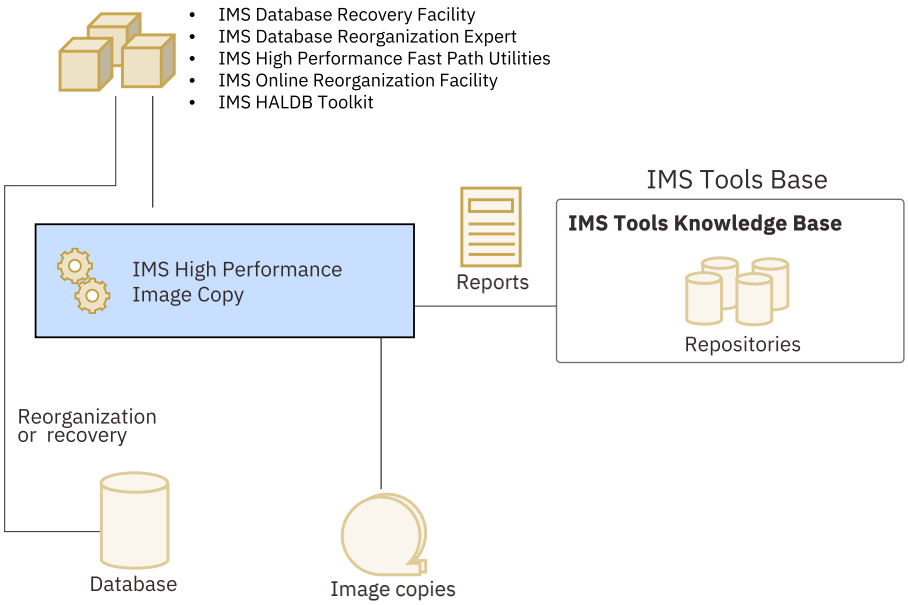
Integration with other IMS tools

IMS HP Image Copy is included in IMS Database Solution Pack, IMS Database Utility Solution, IMS Fast Path Solution Pack, and IMS Recovery Solution Pack. IMS HP Image Copy integrates with IMS tools that are included in these packs, and together they facilitate database reorganization and recovery tasks.

Your reorganization or recovery jobs can automatically start the image copy process of IMS HP Image Copy. The image copy process is run in the same job step as the reorganization or recovery process, and it optionally registers generated image copies to the DBRC RECON data sets. Therefore, you can start using your database immediately after the database is reorganized or recovered.

If you use IMS HP Image Copy with the tools included in IMS Recovery Solution Pack, you can generate new incremental image copy data sets by applying database updates from a log data set or a change accumulation data set to existing image copy data. By using these tools and processes, you can create a new image copy without needing to access the database.

The following figure shows how IMS HP Image Copy integrates with other IMS tools.



Restriction: IMS HP Image Copy reports that are generated in IMS Database Recovery Facility jobs cannot be stored in the IMS Tools Knowledge Base repository.

Support for IBM® IMS Tools Base

IBM® IMS Tools Base for z/OS® (IMS Tools Base) is a no-charge product that contains common infrastructure components, such as the IMS Tools Knowledge Base repositories, which are used by multiple IMS Tools products. IMS Tools Base components support autonomics, interface modernization, and other supplementary tools.

The following table summarizes the IMS Tools Base components and whether they are supported by IMS HP Image Copy.

Table 20: IMS Tools Base components

IMS Tools Base component	Requirement	Description
Autonomics Director	Optional	This component is used for scheduling periodic runs of image copy jobs (with sensor data collection).
Distributed Access Infrastructure	-	This component is not used with IMS HP Image Copy.
IMS Administration Foundation	Optional	This component provides a browser-based graphical user interface and extends the capabilities of IBM® Unified Management Server for z/OS® to manage IMS systems and resources.
IMS Hardware Data Compression Extended	-	This component is not used with IMS HP Image Copy.
IMS Tools Common Services	Required	The IMS Tools Online System Interface component of IMS Tools Common Services is required to run the functions of IMS HP Image Copy. This component is a command interface that allows IMS HP Image Copy to communicate with IMS.
IMS Tools Knowledge Base	Optional	This component is used for storing IMS HP Image Copy reports and sensor data in central repositories.

IMS Tools Base component	Requirement	Description
Policy Services	Optional	This component is used for evaluating sensor data to monitor the health of databases.

For more information about the functions and configuration steps for IMS Tools Base components, see the *IMS Tools Base Configuration Guide*.

Functional changes

The following enhancements are major functional changes that are introduced in IMS HP Image Copy 4.2. You must apply the latest APARs to use these new functions.

IMS-managed ACBs support

The Image Copy function and the Recovery function can run in an IMS environment where the IMS management of ACBs is enabled.

HASH pointer check support for Fast Recovery image copies

You can use the HASH pointer check function to check the database pointers while creating Fast Recovery image copies with the FASTIC=(,COPY) processing. For more information, see "Considerations for using Advanced Image Copy Services" on page 294.

Checkpoint Restart enhancement for stacking image copies

The Checkpoint Restart function is enhanced to provide more granular control over the restart processing when stacking image copies. You can use the RSTTYPE_STK keyword to select the type of restart processing. For more information, see "RSTTYPE_STK keyword" on page 231.

zIIP processor support

You can use the ZIIPMODE keyword to use zIIP processors to offload CPU workload for IMS HP Image Copy jobs.

For a description of the zIIP processor support and how to enable the zIIP processors, see the following topics:

- For the FABJMAIN program, see "Offload workload to zIIP processors" on page 38 and "ZIIPMODE keyword" on page 269.
- For IMS compatible JCL, see "Offload workload to zIIP processors" on page 50 and "Invoking the Image Copy function through stand-alone DFSUDMP0" on page 325.

Conditional image copy registration for the Image Copy function

You can use the NOTIFYMODE keyword to select the image copies that are to be registered to DBRC RECON. By using this keyword, you can avoid registering failed image copies such as image copies with pointer errors or image copies that are to be reprocessed by the Checkpoint Restart function. For more information, see "NOTIFYMODE keyword" on page 221.

New FASTIC mode using FlashCopy® or SnapShot Copy to reduce unavailable time of databases

You can shorten the unavailable time of the database when taking image copies, by using the new FASTIC mode that is enabled with the FASTIC=(,FDUMP) keyword. For more information, see "Using Advanced Image Copy Services with the Image Copy function" on page 291 and "FASTIC keyword" on page 190.

Database quiesce support for IMS 11.1 and later

By using the TOIAUTO_Q keyword, you can take batch image copies of online databases without taking the databases offline. For how to enable this support, see "TOIAUTO_Q keyword" on page 255.

Sensor data collection support

You can schedule Integrated DB Sensor to collect sensor data in the Image Copy function.
DB Sensor collects statistics of IMS databases and stores the data in a central repository that is provided by IMS Tools Knowledge Base. The stored data can be used by Autonomics Director, Policy Services, and IMS Administration Foundation for database analysis and tuning purposes. For more information, see "Collect sensor data with Integrated DB Sensor" on page 44 and "SENSOR keyword" on page 232.

Site Default Generation utility for IMS compatible JCL

The Site Default Generation utility can generate the site default table for use with IMS compatible JCL streams.
The Site Default Generation utility creates a user site default table for the optional processing parameters. You can set default values and have them applied when you run IMS HP Image Copy functions with IMS compatible JCL. For more information, see "Setting default values (IMS compatible JCL)" on page 357.

IMS /START command support

IMS HP Image Copy can issue, through the IMS Tools Online System Interface, the /START command to start the offline database, partition, or area. With this option, you can start IMS applications immediately after the database is initialized or reorganized. For more information, see "TOIAUTO_STA keyword" on page 256.

Service updates and support information

Service updates and support information for this product, including software fix packs, PTFs, frequently asked questions (FAQs), technical articles, troubleshooting information, and downloads, are available from the web.

To find service updates and support information, see the following website:

IBM® Support: IMS High Performance Image Copy for z/OS®

Product documentation and updates

IMS Tools information is available at multiple places on the web. You can receive updates to IMS Tools information automatically by registering with the IBM® My Notifications service.

Information on the web

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

https://www.ibm.com/support/pages/node/712955

The IMS Tools Product Documentation web page includes:

- Links to IBM® Documentation for the user guides ("HTML")
- PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Technical articles from IBM® Software Support
- White papers that describe product business scenarios and solutions

IBM® Redbooks® publications that cover IMS Tools are available from the following web page:

http://www.redbooks.ibm.com

The IBM® Information Management System website shows how IT organizations can maximize their investment in IMS databases while staying ahead of today's top data management challenges:

https://www.ibm.com/software/data/ims

Receiving documentation updates automatically

To automatically receive emails that notify you when new technical articles are released, when existing product documentation is updated, and when new product documentation is available, you can register with the IBM® My Notifications service. You can customize the service so that you receive information about only those IBM® products that you specify.

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4. Click **Continue** to specify the types of updates that you want to receive.
5. Click **Submit** to save your profile.

How to send your comments

Your feedback is important in helping us provide the most accurate and highest quality information. If you have any comments about this information, see How to provide feedback in IBM® Documentation.

When you provide feedback, include as much information as you can about the content you are commenting on, where we can find it, and what your suggestions for improvement might be.

Prerequisite knowledge and publications

Before using this information, you must understand basic IMS concepts, the IMS environment, and your installation's IMS system. Therefore, IMS publications are prerequisite for all IMS HP Image Copy components. You can find IMS publications in IBM® Documentation.

Publications of related IMS Tools

This information refers to other information by using shortened versions of the documentation titles. The following table contains a list of information referred to by their short titles.

Table 21: Publications of related IMS Tools

Short title	Title
IMS Database Reorganization Expert User's Guide	*IBM® IMS Database Reorganization Expert for z/OS® User's Guide*
IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide	• *IBM® IMS Fast Path Solution Pack for z/OS®: IMS High Performance Fast Path Utilities User's Guide* • *IBM® IMS Fast Path Solution Pack for z/OS®: IMS Fast Path Basic Tools User's Guide* • *IBM® IMS Fast Path Solution Pack for z/OS®: Supplementary Utilities User's Guide*
IMS High Performance Pointer Checker User's Guide	*IBM® IMS High Performance Pointer Checker for z/OS®User's Guide*
IMS HALDB Toolkit User's Guide	• *IBM® IMS Database Solution Pack for z/OS®: IMS High Availability Large Database Toolkit User's Guide* • *IBM® IMS Database Utility Solution for z/OS®: IMS High Availability Large Database Toolkit User's Guide*
IMS Database Solution Pack IMS Online Reorganization Facility User's Guide	*IBM® IMS Database Solution Pack for z/OS®: IMS Online Reorganization Facility User's Guide*
IMS Recovery Solution Pack IMS Database Recovery Facility User's Guide	*IBM® IMS Recovery Solution Pack for z/OS®: IMS Database Recovery Facility User's Guide*
IMS Solution Packs Data Sensor User's Guide	*IBM® IMS Solution Packs Data Sensor User's Guide*
IMS Tools Base Autonomics Director User's Guide and Reference	*IBM® Tools Base for z/OS® Autonomics Director User's Guide and Reference*
IMS Tools Base IMS Tools Common Services User's Guide and Reference	*IBM® Tools Base for z/OS®: IMS Tools Common Services User's Guide and Reference*
IMS Tools Base IMS Tools Knowledge Base User's Guide and Reference	*IBM® Tools Base for z/OS®: IMS Tools Knowledge Base User's Guide and Reference*

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully.

Accessibility features

The major accessibility feature of the product is the keyboard-only operation for ISPF editors. It uses the standard TSO/ISPF interface.

Keyboard navigation

You can access IMS ISPF panel functions by using a keyboard or keyboard shortcuts.

For information about navigating the IMS ISPF panels using TSO/E or ISPF, refer to the following publications for information about accessing ISPF interfaces:

- *z/OS® ISPF User's Guide, Volume 1*
- *z/OS® TSO/E Primer*
- *z/OS® TSO/E User's Guide*

These guides describe how to use ISPF, including the use of keyboard shortcuts or function keys (PF keys), include the default settings for the PF keys, and explain how to modify their functions.

IBM® and accessibility

See the IBM® Human Ability and Accessibility Center at www.ibm.com/able for more information about the commitment that IBM® has to accessibility.

IMS HP Image Copy features

IMS HP Image Copy provides various unique features that are not provided in IMS standard utilities.

The following three functions are provided by IMS HP Image Copy:

Image Copy function

The standard image copy process can be started by submitting either of the following JCL jobs:

- FABJMAIN JCL job
- IMS compatible JCL job (JCL streams that are written for the DFSUDMP0 program)

The Advanced Image Copy process can be started only by submitting a FABJMAIN JCL job.

Recovery function

This function can be started by submitting either of the following JCL jobs:

- FABJMAIN JCL job
- IMS compatible JCL job (JCL streams written for the DFSURDB0 program)

Create Image Copy function

This function can be started only by submitting a FABJMAIN JCL job.

A function that is run by the IMS HP Image Copy main module, FABJMAIN, supports all the features of IMS HP Image Copy. The function to be run is controlled by the control statements in the ICEIN data set.

When a function is started by an IMS compatible JCL job, only the limited features of IMS HP Image Copy can be used. It is recommended that you use the FABJMAIN program to run IMS HP Image Copy functions.

The following topics introduce the features of IMS HP Image Copy.

Topics:

- "Summary: IMS HP Image Copy features" on page 34
- "Compressed image copy" on page 35
- "FABJMAIN program features" on page 36
- "Image Copy function features" on page 39
- "Recovery function features" on page 45
- "Create Image Copy function features" on page 46
- "Pointer check for online full-function databases" on page 47

- “Image Copy function (IMS compatible JCL) features” on page 48

Summary: IMS HP Image Copy features

This reference topic summarizes the features that are supported for each function.

Subtopics:

- “IMS HP Image Copy features (stand-alone environment)” on page 34
- “Image copy features under other IMS Tools products” on page 35

IMS HP Image Copy features (stand-alone environment)

The functions of IMS HP Image Copy support the features summarized in the following table.

Table 22: IMS HP Image Copy features (stand-alone environment)

Feature		FABJMAIN program				IMS compatible JCL	
		Standard Image Copy	Advanced Image Copy	Recovery	Create Image Copy	Image Copy	Recovery
Database access method	Advanced Image Copy Services support	-	Yes	Yes Note 1	Yes Note 1	-	Yes Note 1
	High Performance Input/Output interface	Yes	-	Yes	Yes	Yes	-
	OS access method	Yes	-	Yes	Yes	Yes	Yes
Processing type	Parallel processing	Yes	Yes	-	-	-	-
	Database group processing	Yes	Yes	-	Yes	-	-
	Dynamic allocation	Yes	Yes	Yes	Yes	-	-
	Batch image copy and concurrent image copy	Yes	Yes	-	-	Yes	-
Image copy format	IMS image copy	Yes	Yes Note 2	Yes	Yes	Yes	Yes
	Compressed image copy	Yes	Yes Note 3	Yes	Yes	Yes	Yes
	Fast Recovery image copy	-	Yes Note 4	Yes	Yes	-	Yes
	IMS online image copy	-	-	Yes	Yes Note 5	-	Yes
	IMS Image Copy 2 (IC2)	-	-	Yes	Yes Note 5	-	Yes
Processing option	Stacking output image copies	Yes	Yes Note 6	-	Yes	-	-
	Database pointer check (HASH Check)	Yes	Yes	-	-	Yes	-
	Collecting sensor data (DB Sensor)	Yes	Yes	-	-	-	-
	Checkpoint restart	Yes	Yes	-	-	-	-
	Logical relation search	Yes	Yes	-	-	-	-
	Index database search	Yes	Yes	-	-	-	-
	Using latest batch image copy data set	-	-	Yes	Yes	-	-
	Creating physical copy and logical copy	-	-	-	Yes	-	-
	NOTIFY.IC/CHANGE.IC for missing IC record	-	-	-	Yes	-	-
	Creating multiple image copies at one time (maximum number of image copies)	Yes (4)	Yes DUMP(4) FDUMP(4) COPY(2)	-	Yes (7)	Yes (2)	-
	Switching batch image copy process to concurrent image copy process	Yes	Yes	-	-	-	-
	Virtual image copy process	Yes	Yes	-	-	-	-
Online Pointer checking for full-function database	Pointer checking for online full-function databases	-	Yes Note 7	-	-	-	-
Processing option control	Site Default Generation utility	Yes	Yes	Yes	Yes	-	-
IMS command interface	Integration with IMS Tools Online System Interface	Yes	Yes	-	-	-	-
IMS Tools KB support	Central management of reports	Yes	Yes	Yes	Yes	-	-
zIIP support	Offloading workload to zIIP processors	Yes	Yes Note 8	Yes	Yes	Yes	-

Notes:

1. Supported if the input data set is a Fast Recovery image copy data set.
2. Only the FASTIC COPY process supports creating secondary image copies.
3. Only the FASTIC DUMP and FDUMP processes support creating image copies in compressed format.
4. Only the FASTIC COPY process supports creating image copies in Fast Recovery image copy format.
5. Supports Physical Copy method only.
6. FASTIC DUMP and FDUMP support stacking of output image copies.
7. FASTIC DUMP process is not supported.
8. FASTIC COPY process is not supported.

Image copy features under other IMS Tools products

The Image Copy function can be called from certain IMS tools. For information about the image copy features that are supported under other IMS tools, see “Creating image copies in other IMS Tools product jobs” on page 367

Compressed image copy

A compressed image copy has the format of database records that are compressed by one of the IMS HP Image Copy compression routines. The advantage of this format is that it reduces allocation space for output image copy.

The IMS HP Image Copy functions support data sets that are in compressed format. This feature enables you to reduce the number of tapes that are needed to record the image copies.

The Image Copy function generates image copies in compressed format. Once image copies are compressed, you can decompress them with the Recovery function for input to a database recovery job or with the Create Image Copy function for input to create new copy data sets.

You can create image copy data sets in compressed image copy format by using the following image copy options of IMS HP Image Copy:

- The standard image copy process
- The FASTIC DUMP process of Advanced Image Copy Services
- The FASTIC FDUMP process of Advanced Image Copy Services
- The FASTIC COPY process of Advanced Image Copy Services and the OFFLDTYPE=S option, to create secondary image copies in compressed image copy format
- IMS compatible JCL

You can request to compress image copies by specifying the COMP keyword parameter and the COMPRTN keyword parameter in the ICEIN control statement.

Compressed image copy data sets can be created by IMS HP Image Copy and can be used for recovery with IMS HP Image Copy and IMS Database Recovery Facility.

IMS HP Image Copy provides the following compression routines:

FABJCMP1

Runs repeated character compression. Free space can also be compressed.

FABJCMP2

Runs only free space compression. Segmented data is not compressed.

FABJCMP3

Compresses repeating-characters in segment data by the z/OS® program compression method. Free space might also be compressed.

FABJCMP4

Compresses data set records by the z/OS® program compression method. The segment data and free space are not distinguished.

> **Attention:** If the database is a DEDB that has SDEP segments, use FABJCMP4. Other compression routines might damage the SDEP segments.

The following factors are important in selecting a compression method:

- The amount of CPU time used.
- The compression ratio.
- IDRC capability on tape subsystem.
- For DEDBs that have SDEP defined, you must use FABJCMP4.

Generally, FABJCMP1, FABJCMP3, and FABJCMP4 use more CPU time than FABJCMP2, but FABJCMP3 achieves better compression and uses less CPU time than FABJCMP1. FABJCMP4 uses less CPU time than FABJCMP3, but FABJCMP3 achieves better compression than FABJCMP4.

Data compression for IDRC enabled tape drives

A magnetic tape subsystem that uses tape cartridges and has the Improved Data Recording Capability (IDRC) can record data in compacted format. The typical compaction ratio is 2 to 3 depending on the data that is being compressed.

When the IDRC is active on the native IDRC enabled tape drive, software compression is unnecessary; it uses CPU cycles without providing benefit. To prevent unnecessary use of CPU cycles, IMS HP Image Copy behaves as follows for IDRC enabled tape devices:

- When the compression routine is not FABJCMP2, IMS HP Image Copy does not compress database records. Data is compressed by IDRC while it is transmitted to the tape drive. When IDRC is active on the tape device specified for the primary image copy data set, the compression routine is ignored for the other image copies that are taken from the same database data set.
- When the compression routine is FABJCMP2, IMS HP Image Copy uses FABJCMP2 to compress database records. Data is then compressed by IDRC while it is transmitted to the tape drive.

By specifying the COMPMODE keyword, you can deactivate IDRC and use a compression routine instead. Because IDRC is a feature provided by the hardware, a large number of uncompressed database records go through the channel and could lead to a system-wide slowdown. IMS HP Image Copy optimizes I/O buffers for output image copy data sets and can improve the speed of the image copy process.

Use of IDRC does not require a change to software compression parameters for your image copies jobs.

FABJMAIN program features

The following topics introduce the common features that are available when invoking one of the IMS HP Image Copy functions with the FABJMAIN program.

Data set encryption support

IMS HP Image Copy supports z/OS® data set encryption.

IMS HP Image Copy can:

- Read encrypted database data sets of full-function database, HALDB, and DEDB
- Read and create encrypted image copy data sets
- Read encrypted log data sets
- Access and update encrypted DBRC RECON data sets

z/OS® data set encryption is available on z/OS® 2.3 and later.

IMS database of encrypted OSAM is available on IMS 15.2 and later.

Image Copy function

The Image Copy function can create encrypted image copy data sets. To create encrypted image copy data sets, a key label must be assigned to the data set when the data set is initially allocated. If a key label is defined as a DATACLAS attribute, you can override the key label by specifying the KEYLABEL keyword in the ICEIN control statement. Overriding the key label value with the KEYLABEL keyword is effective only when dynamic allocation of image copy data sets is requested.

Considerations:

- If the output device is a tape, image copy data sets cannot be encrypted.
- If the input database data sets are encrypted, the DUMP process of Advanced Image Copy Services cannot be used. If any of the database data sets in the job step is encrypted, IMS HP Image stops all the processes.
- In the COPY process of Advanced Image Copy Services, the DATACLAS and KEYLABEL definitions of the input database data sets are inherited to the output image copy data sets. The KEYLABEL keyword, which

overrides the key label of DATACLAS, cannot be used with the COPY process of Advanced Image Copy Services.

Advanced Image Copy Services support

Advanced Image Copy Services of IMS HP Image Copy allows you to take advantages of point-in-time copy functions (Concurrent Copy, FlashCopy®, and SnapShot) of DFSMSdss Advanced Copy Services to produce image copies faster and reduce unavailability time for IMS databases.

Advanced Image Copy Services uses the DFSMSdss cross-memory application programming interface (API), ADRXMAIA to process DFSMSdss DUMP and COPY commands.

When IMS database data sets reside on EMC DASD, IMS HP Image Copy can use the EMC API to invoke TimeFinder/Clone to copy the data sets instead of using FlashCopy® or SnapShot of DFSMSdss.

IMS HP Image Copy supports three options for Advanced Image Copy Services: COPY, FDUMP, and DUMP. You can request this feature by specifying the FASTIC keyword in the ICEIN control statement. For more information about copy methods and processes of Advanced Image Copy Services, see "Advanced Image Copy Services" on page 288.

Restriction: The DUMP option does not support the following types of database data sets:

- Encrypted database data sets
- Extended format data sets

High Performance Input/Output interface

The The High Performance Input/Output (HP Input/Output or HPIO) interface reduces CPU time and usage while IMS HP Image Copy generates image copies or recovers a database.

You can use HP Input/Output to read a database data set to generate image copies and to write the data set to recover from regular image copy processing.

The following table shows the types of data sets that are supported by the HP Input/Output interface.

Table 23: Data set types supported by the HP Input/Output interface

Data set type	I/O method	Description
OSAM (read and write processing)	EXCP	Used for batch and concurrent image copy processing.
VSAM ESDS (read processing)	EXCP or Media Manager depending on the database type	Used for batch and concurrent image copy processing. Media Manager does not support the overflow data set of HISAM and secondary index databases.
VSAM ESDS (write processing)	Media Manager	Media Manager does not support the overflow data set of HISAM and secondary index databases.
VSAM KSDS (read/write processing)	VSAM I/O	When the data set is a VSAM KSDS, VSAM I/O is always used.

If access method or copy criteria are not compatible with HP Input/Output, IMS HP Image Copy uses the normal access method.

You can enable the HP Input/Output interface by specifying the HPIO keyword in the ICEIN control statement.

Dynamic allocation

IMS HP Image Copy can dynamically allocate input and output data sets, such as database data sets, image copy data sets, log data sets, and change accumulation data sets. You do not need to provide a DD statement for each data set.

You can request dynamic allocation by specifying the following keyword parameters in the ICEIN control statement:

- DBDALLOC=YES
- DSDALLOC=YES
- ICDALLOC=YES

You can omit the DD name for the data set which you want to dynamically allocate.

If you enable dynamic allocation, you can stack output data sets into a tape by specifying the STACK keyword.

Site Default Generation utility

The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs.

The Site Default Generation utility creates a user site default table for the IMS HP Image Copy GLOBAL statement, and this table is used in every IMS HP Image Copy run. The input specification in the Site Default Generation utility is the same as the GLOBAL statement in ICEIN DD.

The generated site default table can be applied to stand-alone IMS HP Image Copy jobs and also to the IMS HP Image Copy process that runs during other IMS tools' jobs.

Central management of reports

IMS HP Image Copy supports the function of the IMS Tools KB Output repository, which enables you to store the reports that are generated by IMS HP Image Copy jobs. The use of IMS Tools KB Output repository helps you simplify management of IMS HP Image Copy reports.

You can request this feature by specifying the ITKBSRVR keyword in the ICEIN control statement.

To store reports of IMS HP Image Copy and IMS HP Pointer Checker that are generated in IMS HP Image Copy processes called from other IMS Tools jobs, see “Storing IMS HP Image Copy reports generated in jobs of other IMS Tools” on page 55.

Offload workload to zIIP processors

IMS HP Image Copy supports the IBM® System z® Integrated Information Processor (zIIP) to offload eligible database workloads to zIIP processors.

Data compression and decompression is one of the most CPU-intensive workloads in IMS HP Image Copy processes. By enabling the zIIP support with the ZIIPMODE keyword, you can use zIIP processors to run the data compression and decompression workloads.

You can enable zIIP processors by the following specifications:

- For the Image Copy function, the workload to create compressed image copies is run by zIIP processors if both ZIIPMODE=COND and COMP=Y are specified.
- For the Recovery function, the workload to read compressed image copies is run by zIIP processors if ZIIPMODE=COND is specified.
- For the Create Image Copy function, the workload to read compressed image copies is run by zIIP processors if ZIIPMODE=COND is specified. The workload to create compressed image copies is also run by zIIP processors if both ZIIPMODE=COND and COMP=Y are specified.

The CPU time consumed on zIIP processors is notified by message FABJ0426I.

Requirements: The following requirements must be met to enable zIIP processors:

- The SGLXLOAD library of IMS Tools Base is added to the STEPLIB DD statement of the IMS HP Image Copy JCL.
- The SGLXLOAD library is APF-authorized.

Considerations before using zIIP processors

Before using zIIP processors, consider and estimate the performance impact of using zIIP processors:

- Using zIIP processors to run eligible workload requires overhead, especially in elapsed time of the job. If you use zIIP processors, you must test the performance impact in the test system before using them in the production system.
- If you enable parallel image copy by specifying the AIC ICEIN statement, you might need to consider the number of zIIP processors that are available. If the number of zIIP processors is considerably less than the number of CPs (main processors), you might see significant performance degradation because the workloads run by the zIIP processors (compression processing) is CPU-intensive, and a small number of zIIP processors causes resource contention.
- Using zIIP processors requires overhead in CPU time. Therefore, the use of zIIP processors is beneficial only if the amount of offloaded CPU time is larger than the amount of overhead CPU time. When both of the following conditions are true, specifying ZIIPMODE=COND, in many cases, results in an increase in CPU time:
  - Image copies are created on tape volumes, such as by using the STACK keyword
  - IDRC is enabled on a tape subsystem

  Under these conditions, the amount of CPU time consumed for the compression routine is not large because compression process is mostly done by hardware, not software. Therefore, the amount of CPU time that is offloaded to zIIP processors is quite small. The additional (overhead) CPU time to use zIIP processors can overwhelm the CPU time that is offloaded to zIIP processors.

Image Copy function features

The Image Copy function of IMS HP Image Copy supports the following features that are not provided by the IMS standard utilities.

Batch image copy and concurrent image copy

IMS HP Image Copy supports two types of image copy processing; batch image copy and concurrent image copy.

Bach image copy

When you run batch image copy, all IMS applications that are accessing the database must be stopped. If the database is updated during the image copy process, the generated output image copy data set cannot be used for recovery purpose. The database access must be stopped by /DBR or /DBD before the image copy process is started.
You can request the batch image copy process by specifying the IC/AIC statement.

Concurrent image copy

Concurrent image copy is a fuzzy image copy that allows you to make a copy of OSAM data sets and VSAM entry-sequenced DBDSs whether IMS is running or the database is online.
By using the concurrent image copy process with the FASTIC(,DUMP) processing of Advanced Image Copy Services, you can create image copies of KSDS data sets.

You can request the concurrent image copy process by specifying the CIC/ACIC statement.

Subtopics:

- “Concurrent image copy processing for VSAM KSDS data sets” on page 40
- “Restrictions for batch image copy and concurrent image copy” on page 40

Concurrent image copy processing for VSAM KSDS data sets

The following considerations apply when you request concurrent image copy processing to create image copy data sets of KSDS data sets:

- If you want to create image copies of VSAM KSDS DBDSs for recovery purposes, use the FASTIC=(,DUMP) processing of the Advanced Image Copy Services. The KSDS data set must be SMS-managed, and the BWO(TYPEIMS) parameter must be specified on the AMS DEFINE or the ALTER statement. This ensures that IMS HP Image Copy detects CI or CA splits which cause the output image copy to be unusable. IMS HP Image Copy attempts to issue the DFSMSdss DUMP command up to 10 times to create the correct output image copy. If CI/CA splits are not resolved, the concurrent image copy process fails with FABJ4245E. However, this does not apply when VIC=Y is specified and the HASH Pointer Check is disabled. For details, see "VIC keyword" on page 263. If the data set is not SMS-managed or if the parameter was not specified on the statements, concurrent image copy processing fails.
- If concurrent image copy processing is requested without the Advanced Image Copy Services (that is, when FASTIC=N), the process creates image copy data sets of VSAM KSDS DBDSs and issues message FABJ0180I. These output image copy data sets cannot be used as input for recovery utilities. If you want to prevent image copy data sets being created when Advanced Image Copy Services is not requested, specify CIC_KSDS=N on the GLOBAL statement. This specification prevents creating image copies when Advanced Image Copy Services is not requested.
- When FASTIC=(,FDUMP) or FASTIC=(,COPY) processing of the Advanced Image Copy Services is requested, concurrent image copy processing cannot create image copies of VSAM KSDS data sets.

Restrictions for batch image copy and concurrent image copy

The following restrictions apply to both batch image copy processing and concurrent image copy processing of the Image Copy function:

- Image copies of HSAM, GSAM, and MSDB databases cannot be created.
- Image copies of ILDS data sets of HALDB partitions cannot be created.
- Image copies of PHIDAM primary index data sets cannot be created.
- When online reorganization (OLR) is active for one or more partitions of a HALDB, image copies of the HALDB partitions cannot be created.
- The large block interface (LBI) is supported only for tape data sets that reside on LBI capable tape devices.

In batch image copy processing, the database that is being copied cannot be updated while the data sets are being read. Before you start the process, issue the /DBR or /DBD command to stop the database. Alternatively, you can use the QUIESCE command with the OPTION(HOLD) option to put the database in a QUIESCE HELD state.

The following restrictions apply to concurrent image copy processing (CIC):

- Image copies of KSDS data sets that are created without the Advanced Image Copy Services (FASTIC=N) cannot be used as input for recovery utilities.
- FASITIC=(,FDUMP) and FASTIC=(,COPY) processing of the Advanced Image Copy Services cannot process KSDSs.
- Databases or areas that are registered with share level 0 are not supported.
- Image copies of databases whose access level is EX (EXCLUSIVE) cannot be created.
- Image copies of nonrecoverable databases cannot be created.

Certain considerations apply when you create concurrent image copies of VSAM KSDS data sets with Advanced Image Copy Services that uses the DFSMSdss™ DUMP command. For details, see "Considerations for using Advanced Image Copy Services" on page 294.

Parallel processing

The Image Copy function can process more than one database data sets in parallel. Processing tasks in parallel decreases elapsed processing time.

Parallel processing is supported for the following processes:

- Batch image copy process
- Concurrent image copy process
- Group process of batch image copy or concurrent image copy

You can choose either sequential processing or parallel processing for each process. Parallel processing and sequential processing can coexist in one job step.

To apply parallel processing, you use the AIC or the ACIC statement, or the FUNC=AIC or the FUNC=ACIC in the GROUP statement.

You can control the number of parallel processes by using the TASKCTL keyword or the GRPLIM keyword.

Database group processing

In database group processing, all database data groups and areas that are registered to a change accumulation (CA) group or a database data set (DBDS) group in DBRC are processed.

IMS HP Image Copy *does not support* database groups whose members are registered by area name. Group processing requires that DBRC is active.

Database group processing is requested by specifying the GROUP statement.

Stacking output image copies

Places two or more image copy data sets on the same tape or on a set of tapes (stacking) to increase the tape media efficiency.

You can request *stacked output* by specifying the STACK keyword in either of the following formats in the ICEIN control statement.

STACK=*ddname*
or
STACK=(*ddname1,ddname2*)

For example, if you specify the following control statements, the output image copy data sets from database data set groups DBDSA, DBDSB, and DBDSC are stacked into one set of tapes having the volume serial numbers VOL001, VOL002, and VOL003, respectively.

```
GLOBAL VOLSER=(VOL001,VOL002,VOL003)
IC DBD=SAMPDBD,DDN=DBDSA,STACK=STACK1
IC DBD=SAMPDBD,DDN=DBDSB,STACK=STACK1
IC DBD=SAMPDBD,DDN=DBDSC,STACK=STACK1
```

Database pointer check (HASH Check)

The Image Copy function can check the accuracy of database pointers while it creates image copies. By enabling the Hash Check option, you need only to take image copies instead of running pointer check utilities to verify the pointers of databases. You can reduce the number of jobs for verifying the pointers of image copies taken.

HASH Check is supported for DL/I databases, High Availability Large Databases (HALDB), and Data Entry Databases (DEDB). HASH Check is provided by the following programs:

HD Pointer Checker utility of IMS HP Pointer Checker

When IMS HP Pointer Checker is used regularly, it helps ensure that your database pointers are error free, alerting you when it is time to perform a database reorganization. To help programmers analyze corrupted databases, IMS HP Pointer Checker provides important information that helps to reduce the time spent handling diagnostics and repairs. These reports reveal errors and their locations within the database, facilitating system tuning and optimization.
If you enable the HASH Check option of the HD Pointer Checker utility within an image copy job for an IMS full-function database, HALDB database, or both, you can check the accuracy of the image copy while image copy processes are running.

DEDB Pointer Checker utility of IMS HP Fast Path Utilities

IMS Fast Path Solution Pack is composed of multiple tools and utilities. By using these tools and utilities, you can easily and quickly develop a standard, single driver for unloading, reloading, reorganizing, analyzing, and extracting multiple Data Entry Database (DEDB) areas.

If you enable the HASH Check option of the DEDB Pointer Checker utility within an image copy job for a DEDB, you can check the accuracy of the image copy while image copy processes are running.

HD Pointer Checker HASH Check option

IMS HP Image Copy supports two methods for invoking the HD Pointer Checker HASH Check option:

Single-step HASH Check

Submit an image copy job to run Hash Check job in single step.

Multiple-step HASH Check

Run a DBD analysis program step before the Image Copy step, and a HASH evaluation program step after the image copy step.

Single-step HASH Check is recommended if you want to create and run the JCL with simple steps. Multiple-step HASH Check is recommended, however, if you want to shorten the time needed to get the image copy. With multiple-step HASH Check, HD Pointer Checker HASH Check is done after creating image copies. If, for example, there are many data sets of which you want to make image copies, run the image copy jobs separately, but run the HASH evaluation program only once.

You can request this feature by specifying the HDPC keyword in the ICEIN control statement.

You can also start the Space Monitor utility of IMS HP Pointer Checker during the IMS HP Image Copy job. The Space Monitor utility checks the database data sets and reports on space utilization. You can request this feature by specifying the SPMN keyword in the ICEIN control statement.

DEDB Pointer Checker HASH Check option

The DEDB Pointer Checker HASH Check option can be used to verify the pointers of DEDB areas.

You can request this feature by using the DEDBPC keyword in the ICEIN control statement.

Types of errors detected by HASH Check option

During HASH Check, the HD Pointer Checker or the DEDB Pointer Checker detects the following two types of errors:

Unidentified error

Pointer Checker reports an error as an *unidentified error* when the cause of the error could be considered as the target database being updated. An unidentified error might not be a pointer error and it might be resolved when the database becomes stable. You can run the stand-alone Pointer Checker to identify the cause of an unidentified error.

Severe error

Pointer Checker reports an error as a *severe error* when the cause of the error is determined as the target database being corrupted and that the database is in need of repair.

These errors are reported in the Image Copy Process Summary report.

Checkpoint Restart

This option provides Checkpoint Restart capabilities for the Image Copy function. You can use the Checkpoint Restart option to reprocess failed image copies without reprocessing previously successful image copies by rerunning the same JCL stream that is used in the previous run.

To enable the Checkpoint Restart option, make the following specifications in your JCL:

- Specify the checkpoint file on the CHKPTDD DD statement
- Specify the RESTART keyword
- Specify the RSTTYPE keyword and the RSTTYPE_STK keywords (optional)

In order for a restart to begin, the image copy environment must be precisely the same as the one existing at the time of the checkpoint. If any image copies have been added or subtracted, the restart is invalidated.

You can select the unit of restart with the RSTTYPE keyword in the ICEIN control statement.

Logical relation search

The Image Copy function searches for all the databases that are logically related with the specified database, all the index databases that are defined for the specified database, and all the index databases that are defined for the identified logically related databases. Then the function creates image copies of all the databases, and registers all the index databases to the DBRC RECON data sets as nonstandard image copies (UIC records).

The advantage of using this option is that you do not need to specify all databases in the ICEIN control statement or create a GROUP entry for the group of logical relationships.

The logical relation search option does not support index data sets of PHIDAM database and indirect list data set (ILDS) of HALDB.

To enable the logical relation search option, you must have IMS HP Pointer Checker installed.

You can enable this option by specifying the DBALL keyword. This keyword has an option to exclude index databases from the scope of the search.

Index database search

If the index database search option is enabled, the Image Copy function searches for the primary and secondary index databases that are defined for the specified database and registers them to the DBRC RECON data sets as nonstandard image copies (UIC records).

The advantage of using this option is that you do not need to specify all the index databases in the ICEIN control statement or add index databases to the DBRC GROUP entry.

The index database search option does not support index data sets of PHIDAM database and indirect list data set (ILDS) of HALDB.

You can enable this option by specifying the IDXSRCH keyword.

Create multiple image copies at one time

The Image Copy function can create up to four image copy data sets for each database data set or area data set in a single run.

To create multiple image copies, specify the ICOUT keyword and the STACK keyword on the ICEIN control statement.

Restrictions:

- When one of the following conditions is met, the maximum number of image copy data sets that the Image Copy function can create for each database data set in a single run is two.
  - Fast Recovery image copy format of Advanced Image Copy Services is requested (FASTIC=(*opt*,COPY))
  - IMS HP Image Copy process is called from one of the following IMS Tools:
    - Parallel Reorganization Service of IMS Database Reorganization Expert
    - IMS HP Fast Path Utilities
    - IMS Database Recovery Facility
    - IMS Online Reorganization Facility
- The Checkpoint Restart option does not support the third and fourth image copies. When the Checkpoint Restart option is activated and an error is detected in either the third copy or the fourth copy, the Image Copy function is not restarted.

Switch batch image copy processing to concurrent image copy processing

If the FALLBACK option is enabled, the Image Copy function switches batch image copy processing to concurrent image copy processing when exclusive authorization of the input database is not granted.

If the Image Copy function fails to obtain exclusive authorization of the database and some other transactions access the database during batch image copy processing, the Image Copy function cannot create image copies of the database. For full-function databases and HALDBs, the image copy job ends abnormally. For DEDBs, the function bypasses the area data set that is being accessed by other transactions and continues with the next area data set or database data set. If you enable the FALLBACK option, batch image copy processing is switched to concurrent image copy processing when such a condition occurs. The advantage of using this option is that you do not need to rerun the image copy job even when exclusive authorization of the database is not granted.

Specify the FALLBACK keyword to enable the FALLBACK option.

Virtual image copy process

The virtual image copy process does not create physical image copies but registers identifiable information (UIC records) for the primary and secondary index databases to DBRC. The use of the virtual image copy process is beneficial when you want to run HASH check for an index database data set without creating image copies.

UIC records, which contain the time stamp of the process, are registered to DBRC through the NOTIFY.UIC commands that IMS HP Image Copy issues.

You can request this feature by specifying the VIC keyword.

Notes:

- The virtual image copy process is not supported for the primary index database of PHIDAM.
- The virtual image copy process does not create physical image copies, therefore, you cannot create image copies for database recovery with this process. Consider using other means, such as rebuilding IMS Index Builder, when you recover databases.
- If you do not request HASH check for index databases, you can specify BYPDBAUTH=Y to bypass DBRC database authorization for index databases. In this case, IMS HP Image Copy does not allocate or obtain authorization of the index database data sets.

IMS command interface through IMS Tools Online System Interface

Using the IMS Tools Online System Interface ensures that the database being image copied is available and in the appropriate state. Time is saved because you need not manually bring the database down prior to image copy and up again after the image copy is complete.

IMS HP Image Copy uses the IMS Tools Online System Interface to automatically stop access to IMS databases prior to taking a batch image copy. This feature is enabled by specifying the TOIAUTO keyword in the ICEIN control statement.

When taking a batch image copy, alternative to bringing down and up the database, you can have IMS HP Image Copy use the IMS Tools Online System Interface to issue database quiesce commands. This feature is enabled by specifying the TOIAUTO_Q keyword in the ICEIN control statement.

For more information about the IMS Tools Online System Interface, see the *IMS Tools Base IMS Tools Common Services User's Guide and Reference*.

Collect sensor data with Integrated DB Sensor

You can schedule Integrated DB Sensor to collect sensor data in the Image Copy function.

DB Sensor collects statistics of IMS databases and stores the data in a central repository that is provided by IMS Tools Base IMS Tools Knowledge Base. The stored data can be used by Autonomics Director, Policy Services, and IMS Administration Foundation for database analysis and tuning purposes.

To store statistics of IMS databases, DB Sensor scans databases and collects information about the characteristics of the organization of the data in each database. It also collects information from the system catalog, VSAM catalog, and Volume Table of Contents (VTOC). Then, DB Sensor stores the information as sensor data in the Sensor Data repository of IMS Tools Knowledge Base.

The data that is stored in the Sensor Data repository of IMS Tools Knowledge Base is used in Autonomics Director jobs to monitor and maintain the health, performance, and recoverability of the database. In

Autonomics Director jobs, policy evaluation of Policy Services is internally called to evaluate the database state based on the sensor data that is stored in the Sensor Data repository. When the jobs end, you can use IMS Administration Foundation to view graphical visualization and charting of sensor data, the exceptions that were detected by the policy evaluations, and recommendations for resolving the exceptions.

IMS Tools Knowledge Base, Policy Services, and Autonomics Director are provided in IBM® IMS Tools Base for z/OS®. For more information about these tools, see the following information:

- *IMS Tools Base IMS Tools Knowledge Base User's Guide and Reference*
- *IMS Tools Base Policy Services User's Guide and Reference*
- *IMS Tools Base Autonomics Director User's Guide and Reference*

Certain considerations apply when you collect sensor data from online databases. For details, see the consideration topics in the *IMS Solution Packs Data Sensor User's Guide*.

To schedule Integrated DB Sensor, specify the SENSOR=Y keyword on the GLOBAL statement of the ICEIN DD.

Integration with other IMS tools

The Image Copy function of IMS HP Image Copy can be invoked in the jobs of other IMS Tools products to create image copies within the jobs.

Various features of IMS HP Image Copy are available under the following products:

- IMS Database Recovery Facility
- IMS Database Reorganization Expert
- IMS HP Fast Path Utilities
- IMS Online Reorganization Facility
- IMS HALDB Toolkit

For more information about using the Image Copy function with these tools, see "Creating image copies in other IMS Tools product jobs" on page 367.

Recovery function features

The Recovery function of IMS HP Image Copy recovers a database from image copies. The Recovery function supports three main features for database recovery: full recovery, time stamp recovery, and recovery from latest batch image copy data set.

IMS Database Recovery Facility, which is provided with IMS Recovery Solution Pack, supports various features for database recovery. IMS Database Recovery Facility allows you to simultaneously recover multiple database data sets, HALDB partitions, and Fast Path areas. It also integrates with other IMS Tools products to create image copies, rebuild indexes, and validate recovered databases. Before you use the Recovery function of IMS HP Image Copy, compare the recovery features available in two tools and use the tool that is more appropriate to your recovery needs.

Recovery features supported by the Recovery function of IMS HP Image Copy

Full recovery

Recovers the database by using the most current information available such as image copy data sets, change accumulation data sets, and log data sets.

Time stamp recovery

Recovers the database to a point in time. This option is enabled with the TIMESTMP=*timestamp* keyword. The time stamp you specify must match the time stamp of the recovery point registered in DBRC.

Recovery from the latest batch image copy data set

Automatically detects the latest batch image copy data set in DBRC and uses it to recover the database. No logs or change accumulation data sets are used for recovery. This option is enabled with the TIMESTMP=LASTIC or TIMESTMP=LASTICALL keyword. You can request the Recovery function to either:

- Detect and use the latest batch image copy that is in standard image copy format (TIMESTMP=LASTIC)
- Detect and use the latest batch image copy regardless of the format of image copy (TIMESTMP=LASTICALL)

Recovery features supported by IMS Database Recovery Facility

Recovery of multiple resources in a single job step

Recovers multiple full-function databases, HALDB partitions, and DEDB areas in a single pass of the change accumulation and log data sets.

Point-in-time recovery

Performs time stamp recovery by using time stamps that are not restricted to allocation boundaries. The ability to recover to any point in time allows you to recover IMS databases to the same point in time as other databases in your environment.

Integration with other IMS Tools products

Integrates with several other IMS Tools products as integrated auxiliary utilities to allow you to create new image copies, rebuild primary and secondary index data sets and HALDB index list data sets, and validate recovered databases.

Create Image Copy function features

The Create Image Copy function, unique to IMS HP Image Copy, supports the following features.

Database group processing

In database group processing, all database data groups and areas that are registered to a change accumulation (CA) group or a database data set (DBDS) group in DBRC are processed.

IMS HP Image Copy *does not support* database groups whose members are registered by area name. Group processing requires that DBRC is active.

Database group processing is requested by specifying the GROUP statement.

Stacking output image copies

Places two or more image copy data sets on the same tape or on a set of tapes (stacking) to increase the tape media efficiency.

You can request *stacked output* by specifying the STACK keyword in either of the following formats in the ICEIN control statement:
STACK=*ddname*
or
STACK=(*ddname1,ddname2*)
For example, if you specify the following control statements, the output image copy data sets from the database set groups DBDSA, DBDSB, and DBDSC are stacked into one set of tapes having the volume serial numbers VOL001, VOL002, and VOL003, respectively.

```
GLOBAL VOLSER=(VOL001,VOL002,VOL003)
CRC DBD=SAMPDBD,DDN=DBDSA,STACK=STACK1
CRC DBD=SAMPDBD,DDN=DBDSB,STACK=STACK1
CRC DBD=SAMPDBD,DDN=DBDSC,STACK=STACK1
```

Detect and use the latest batch image copy data set

IMS HP Image Copy can detect the latest batch image copy data set that is registered to the DBRC and use it as input data set.

You can request this feature by specifying the TIMESTAMP=LASTIC or TIMESTAMP=LASTICALL keyword in the ICEIN control statement.

Create physical copy and logical copy

The Create Image Copy function supports two process types; physical copy and logical copy.

Physical copy creates new data sets without changing the compression routine of the input image copy data set. Logical copy creates new data sets by using a different compression routine from the input image copy data set.

Logical copy can also create new image copy data sets by converting the format of the input image copy data sets.

Logical copy is not supported for input data sets that are created by the following utilities

- IMS Database Image Copy 2 utility
- IMS Online Database Image Copy utility

Use the CRCTYPE keyword of the ICEIN control statement to specify whether to apply physical copy or logical copy.

Issue NOTIFY.IC/CHANGE.IC for missing IC record

The Create Image Copy function can issue the NOTIFY.IC command or the CHANGE.IC command to register the output data set to RECON.

The function issues the NOTIFY.IC or CHANGE.IC command for the output image copy data set when one of the following conditions is met:

- If only the primary image copy data set is registered to RECON as an available IC record, the Create Image Copy function issues the NOTIFY.IC or CHANGE.IC command for the first output data set and registers it to RECON as the secondary image copy data set.
- If either the primary image copy data set or the secondary image copy data set is flagged as an error in RECON, the Create Image Copy function issues DELETE.IC and NOTIFY.IC, or CHANGE.IC command for the first output data set and registers it to RECON instead of the erroneous IC record.
- If the type of the input image copy data set does not match the DBRC record, the Create Image Copy function issues the DELETE.IC and NOTIFY.IC commands for both the input image copy data set and the primary output image copy data set. By these commands, the primary output image copy data set is registered to RECON and the type of the image copy data set is changed to the correct type, which is consistent with the input image copy data set and the registered record in RECON. These commands are available *only* for the batch image copy and the concurrent image copy.

You can request this feature by using the NOTIFY=Y keyword parameter in the ICEIN control statement.

Create multiple image copies at one time

The Create Image Copy function can create up to seven copies of the input data set in one run.

You can request this feature by using the ICOUT keyword parameter and the STACK keyword parameter in the ICEIN control statement.

Pointer check for online full-function databases

To completely check the pointers of online full-function databases, static images of the databases must be captured, which requires the online databases to be stopped. This restriction cannot be avoided.

However, you can reduce the amount of time that the databases are stopped by using two features of IMS HP Image Copy: the HASH Check option with the TOIAUTO (or TOIAUTO_Q) keyword and the Advanced Image Copy Services (FASTIC). By enabling these two features, you can run HASH pointer check for online databases in *pseudo online pointer check mode*. In this mode, HASH pointer check is run with automatic database start and stop operations, which result in the databases being unavailable for the shortest amount of time possible. This function is called the *Online Pointer Checking* function.

When you run an IMS HP Image Copy job in pseudo online pointer check mode, the IMS HP Image Copy job works as follows:

1. IMS HP Image Copy automatically stops the database.
2. IMS HP Image Copy creates FlashCopy® files of databases.
3. IMS HP Image Copy automatically restarts the databases.
4. IMS HP Image Copy runs a HASH pointer check on the FlashCopy® files.
5. IMS HP Image Copy deletes the FlashCopy® files or keeps the FlashCopy® files as Fast Recovery image copies.

6. IMS HP Image Copy ends the job.

By running jobs in this mode, you can consistently run HASH pointer check for online full-function databases.

When a job is run in this mode, the online databases become temporarily unavailable (they are taken offline or quiesced) during processes 1 and 2, but you do not need to manually issue any IMS commands to stop or restart the databases. IMS HP Image Copy automatically issues the required IMS commands to stop or restart the databases. To help ensure that these commands run successfully, consider running the job during a time period in which the databases are rarely updated.

In the pseudo online pointer check mode process, IMS HP Image Copy creates FlashCopy® files. You can keep the FlashCopy® files as Fast Recovery image copies or have the files deleted as shadow data sets. When the FlashCopy® files are kept as Fast Recovery image copies, IMS HP Image Copy registers the IC records to DBRC RECON data sets. When the FlashCopy® files are processed as shadow data sets, IMS HP Image Copy does not register the IC records to DBRC RECON data sets. You can also create image copy data sets in the standard image copy format of IMS HP Image Copy in addition to the FlashCopy® files. See "Examples for running Online Pointer Checking for full-function databases" on page 151 for JCL examples.

Notes:

- The Online Pointer Checking function works for IMS full-function databases. You cannot use this function for DEDBs.
- The Online Pointer Checking function can be used when you run IMS HP Image Copy with the FABJMAIN program. You cannot use this function when you run IMS HP Image Copy with IMS compatible JCL.

Enabling pointer check for online full-function databases

To run an IMS HP Image Copy job in pseudo online pointer check mode for full-function databases, you must specify the following keywords on the ICEIN IC, AIC, CIC, or ACIC statement:

HDPC=Y

This required keyword requests a HASH pointer check for full-function databases.

TOIAUTO=Y or TOIAUTO_Q=Y

This required keyword requests IMS Tools Online System Interface to issue IMS commands. Through the interface, IMS HP Image Copy issues the /DBDUMP or the /DBRECOVERY command, or it requests to quiesce the databases.

FASTIC=(*opt*,COPY) or FASTIC=(*opt*,FDUMP)

This required keyword requests the FlashCopy® process of the Advance Copy Services. If you specify FASTIC=(*opt*,FDUMP), you must also specify the SHDWDSN or the SHDWHLQ keyword.

ICOUT=%NO or STACK=%NO

This optional keyword requests that image copy data sets are not created.

Image Copy function (IMS compatible JCL) features

The Image Copy function that is invoked by DFSUDMP0 JCL supports the following features.

High Performance Input/Output interface

The High Performance Input/Output (HP Input/Output or HPIO) interface reduces CPU time and usage while IMS HP Image Copy generates image copies or recovers a database.

You can use HP Input/Output to read the database data set to generate image copies and to write the data set to recover from regular image copy processing.

The following table shows the types of data sets that are supported by the HP Input/Output interface.

Table 24: Data set types supported by the HP Input/Output interface		
Data set type	**I/O method**	**Description**
OSAM (read and write processing)	EXCP	Used for batch and concurrent image copy processing.
VSAM ESDS (read processing)	EXCP or Media Manager depending on the database type	Used for batch and concurrent image copy processing. Media Manager does not support the overflow data set of HISAM and secondary index databases.
VSAM KSDS (read processing)	VSAM I/O	When the data set is a VSAM KSDS, VSAM I/O is always used.

If access method or copy criteria are not compatible with HP Input/Output, IMS HP Image Copy uses the normal access method.

You can enable the HP Input/Output interface by specifying HPIO=Y on the PARM parameter of the EXEC statement in DFSUDMP0 JCL.

Database pointer check (HASH Check)

The Image Copy function can check the accuracy of database pointers while it creates image copies. By enabling the Hash Check option, you need only to take image copies instead of running pointer check utilities to verify the pointers of databases. You can reduce the number of jobs for verifying the pointers of image copies taken.

HASH Check is supported for DL/I databases, High Availability Large Databases (HALDB), and Data Entry Databases (DEDB). HASH Check is provided by the following programs:

HD Pointer Checker utility of IMS HP Pointer Checker

When IMS HP Pointer Checker is used regularly, it helps ensure that your database pointers are error free, alerting you when it is time to perform a database reorganization. To help programmers analyze corrupted databases, IMS HP Pointer Checker provides important information that helps to reduce the time spent handling diagnostics and repairs. These reports reveal errors and their locations within the database, facilitating system tuning and optimization.
If you enable the HASH Check option of the HD Pointer Checker utility within an image copy job for an IMS full-function database, HALDB database, or both, you can check the accuracy of the image copy while image copy processes are running.

DEDB Pointer Checker utility of IMS HP Fast Path Utilities

IMS Fast Path Solution Pack is composed of multiple tools and utilities. By using these tools and utilities, you can easily and quickly develop a standard, single driver for unloading, reloading, reorganizing, analyzing, and extracting multiple Data Entry Database (DEDB) areas.
If you enable the HASH Check option of the DEDB Pointer Checker utility within an image copy job for a DEDB, you can check the accuracy of the image copy while image copy processes are running.

HD Pointer Checker HASH Check option

IMS HP Image Copy supports two methods for invoking the HD Pointer Checker HASH Check option:

Single-step HASH Check

Submit an image copy job to run Hash Check job in single step.

Multiple-step HASH Check

Submit a DBD analysis program step before the Image Copy step, and a HASH evaluation program step after the image copy step.

Single-step HASH Check is recommended if you want to create and run the JCL with simple steps. Multiple-step HASH Check is recommended, however, if you want to shorten the time needed to get the image copy. With multiple-step HASH Check, HD Pointer Checker HASH Check is done after creating image copies. If, for example, there are many data sets of which you want to make image copies, run the image copy jobs separately, but run the HASH evaluation program only once.

You can request this feature by specifying in the utility control statement.

DEDB Pointer Checker HASH Check option

The DEDB Pointer Checker HASH Check option can be used to verify the pointers of DEDB areas.

You can request this feature by specifying in the utility control statement.

Create multiple image copies at one time

The Image Copy function can create multiple image copy data sets in one run.

You can request this feature by specifying in the utility control statement.

Site Default Generation utility

The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs.

The Site Default Generation utility creates a user site default table for the optional processing parameters. Without the site default table, you provide the optional processing parameters by specifying them on the EXEC PARM parameter or through the SYSIN data set. However, if you create a site default table, these parameters are applied to every IMS HP Image Copy run, therefore, you do not need to specify them in each IMS compatible JCL job.

Offload workload to zIIP processors

IMS HP Image Copy supports the IBM® System z® Integrated Information Processor (zIIP) to offload eligible database workloads to zIIP processors.

Data compression and decompression is one of the most CPU-intensive workloads in IMS HP Image Copy processes. By enabling the zIIP support with the ZIIPMODE keyword, you can use the zIIP processor to run the data compression and decompression workloads.

For the Image Copy function, the workload to create compressed image copies is run by zIIP processors if all of the following conditions are met:

- The Image Copy function is invoked by DFSUDMP0 (zIIP processor is not supported when the function is invoked by DFSRRC00)
- ZIIPMODE=COND is specified for the PARM keyword
- Image Copy compression is enabled (Y is specified on position 39 of the SYSIN control statement)

The CPU time consumed on zIIP processors is notified by message FABJ0426I.

Requirements: The following requirements must be met to enable zIIP processors:

- The SGLXLOAD library of IMS Tools Base is added to the STEPLIB DD statement of the JCL.
- The SGLXLOAD library is APF-authorized.

Considerations before using zIIP processors

Before using the zIIP processors, consider and estimate the performance impact of using zIIP processors:

- Using zIIP processors to run eligible workload requires overhead, especially in elapsed time of the job. If you use zIIP processors, you must test the performance impact in the test system before using them in the production system.
- Using zIIP processors requires overhead in CPU time. Therefore, the use of zIIP processors is beneficial only if the amount of offloaded CPU time is larger than the amount of overhead CPU time. When both of the following conditions are true, specifying ZIIPMODE=COND, in many cases, results in an increase in CPU time:
  - Image copies are created on tape volumes
  - IDRC is enabled on a tape subsystem

Under these conditions, the amount of CPU time consumed for the compression routine is not large because compression process is mostly done by hardware, not software. Therefore, the amount of CPU time that is offloaded to zIIP processors is quite small. The additional (overhead) CPU time to use zIIP processors can overwhelm the CPU time that is offloaded to zIIP processors.

Configuring IMS HP Image Copy

The following topics provide detailed information about setting up and configuring IMS HP Image Copy.

Topics:

- "Completing IMS HP Image Copy installation" on page 52
- "Customizing IMS HP Image Copy" on page 54

Completing IMS HP Image Copy installation

IMS HP Image Copy is installed by using SMP/E and standard RECEIVE, APPLY, and ACCEPT processing.

Topics:

- "Hardware and software prerequisites" on page 52
- "Compatibility with earlier releases" on page 53
- "Post-installation task: APF authorizing load libraries" on page 54

Hardware and software prerequisites

Before you install IMS HP Image Copy, verify that your environment meets the following hardware and software requirements.

Complete information about installation requirements, prerequisites, and procedures for IMS HP Image Copy is located in the *Program Directory for IMS High Performance Image Copy for z/OS®* (GI10-8671).

Subtopics:

- "Hardware requirements" on page 52
- "Software requirements" on page 52
- "Conditional operational requisites" on page 52

Hardware requirements

IMS HP Image Copy runs on any hardware configuration that supports the required versions of IMS.

Software requirements

IMS HP Image Copy operates in the z/OS® environment. The operating system requirements are the same as those for IMS.

To use IMS HP Image Copy, you need one of the currently supported versions of IMS.

Installation requirements

IBM® IMS Tools Base for z/OS® 1.7 (5655-V93) or later.

Conditional operational requisites

To use the following features, you must install additional products:

Advanced Image Copy Services

IBM® z/OS® DFSMSdss™ (5650-ZOS)

HASH Check option for full-function databases

- IBM® IMS High Performance Pointer Checker for z/OS® 3.1 (5655-U09)
- DFSORT™ (Data Facility Sort), part of z/OS®, or a functionally equivalent sort-and-merge program

HASH Check option for DEDBs

- IMS High Performance Fast Path Utilities provided in IBM® IMS Fast Path Solution Pack for z/OS® 2.1 (5698-FPP) or later
- DFSORT™ (Data Facility Sort), which is included in z/OS®, or a functionally equivalent sort-and-merge program

Central report management

IMS Tools Knowledge Base provided in IBM® IMS Tools Base for z/OS® 1.7 (5655-V93) or later

IMS command interface

IMS Tools Common Services provided in IBM® IMS Tools Base for z/OS® 1.7 (5655-V93) or later

Sensor data collection for full-function databases

IBM® IMS Tools Base for z/OS® 1.7 (5655-V93) or later and one of the following products:

- IBM® IMS Database Solution Pack for z/OS® 2.2 (5655-DSP) or later
- IBM® IMS Database Utility Solution for z/OS® 2.1 (5698-DUL) or later

Sensor data collection for DEDBs

- IBM® IMS Fast Path Solution Pack for z/OS® 2.1 (5698-FPP) or later
- IBM® IMS Tools Base for z/OS® 1.7 (5655-V93) or later

zIIP processor support

- IBM® System z® Integrated Information Processor (zIIP) must be configured in your z/OS® environment
- IMS Tools Common Services in IBM® IMS Tools Base for z/OS® 1.7 (5655-V93) or later

RECALL option

IBM® z/OS® DFSMShsm (5650-ZOS)

Compatibility with earlier releases

IMS HP Image Copy 4.2 is compatible with earlier releases of the product.

Consideration for the Checkpoint Restart function

If you have been using the Checkpoint Restart option of IMS HP Image Copy 4.1 or of earlier releases, and you plan to migrate to IMS HP Image Copy 4.2, you must discard the existing checkpoint file that is specified on the CHKPTDD DD statement and create a new checkpoint file with IMS HP Image Copy 4.2.

Consideration for IMS Tools Online System Interface configuration

If you have been using IMS Tools Online System Interface in IMS High Performance Image Copy for z/OS® 4.1, you must migrate to IMS Tools Online System Interface that is included in IMS Tools Base.

Identify the release of IMS Tools Online System Interface that you have been using with IMS High Performance Image Copy for z/OS® 4.1. IMS High Performance Image Copy for z/OS® 4.1 supports the following IMS Tools Online System Interface releases:

- FMID H2B7110 (packaged with IMS High Performance Image Copy for z/OS® 4.1)
- FMID H2B7120 (packaged with other IMS Tools products. This release supersedes and deletes H2B7110.)
- FMID H32A130 (packaged with other IMS Tools products. This release supersedes and deletes H2B7110, H2B7120, H32A110, and H32A120.)

Migration steps are different based on the release of IMS Tools Online System Interface. For details about installation, set up instructions, and migration considerations for IMS Tools Online System Interface, see the *Program Directory for IBM IMS Tools Base for z/OS®*, the *IMS Tools Base IMS Tools Common Services User's Guide and Reference*, or the *IMS Tools Base Configuration Guide*.

Post-installation task: APF authorizing load libraries

If you plan to use IMS HP Image Copy with one ore more of the following features, all the concatenated load libraries of the STEPLIB DD must be APF-authorized.

- High Performance I/O
- Advanced Image Copy Services
- IMS Tools Online System Interface
- IMS Tools Knowledge Base
- zIIP processor
- Database Sensor
- HASH Check option with Space Monitor (for full-function databases)

Customizing IMS HP Image Copy

After you install IMS HP Image Copy, you can customize IMS HP Image Copy to tailor the product for your environment.

Topics:

- "Setting up the report repository" on page 54
- "Starting the DFSMSdss server address space" on page 57
- "Commands and required access levels for RACF APPL resource class authority" on page 58
- "Setting default values for the FABJMAIN program" on page 58
- "Generating JCL by using the GENJCL command" on page 62

Setting up the report repository

IMS HP Image Copy supports the function of the IMS Tools Base IMS Tools KB Output repository, which can store and centrally manage IMS HP Image Copy reports.

To use this function, you must install and configure IMS Tools Knowledge Base (IMS Tools KB), which is provided by IBM® IMS Tools Base for z/OS®.

Subtopics:

- "Reports that can be stored in the IMS Tools KB repository" on page 54
- "Configuration steps to use the IMS Tools KB repository" on page 55
- "Storing IMS HP Image Copy reports generated in jobs of other IMS Tools" on page 55

Reports that can be stored in the IMS Tools KB repository

IMS HP Image Copy can store the following IMS HP Image Copy reports in the Output repository of IMS Tools KB:

- ICEIN Statements report
- Global Options report
- Environment report
- Image Copy Processing messages
- Image Copy Dump Process report
- Image Copy Process Summary report
- Image Copy Stacking Process report
- Data Set Statistics report

- Recovery Process report
- Create Image Copy report
- DBRC NOTIFY.IC Processing report
- Selected Area report

IMS HP Image Copy can store reports in the IMS Tools KB Output repository only when the IMS HP Image Copy function is invoked by FABJMAIN JCL. Reports cannot be stored in the repository if the function is invoked by IMS compatible JCL.

Configuration steps to use the IMS Tools KB repository

To store IMS HP Image Copy reports in the IMS Tools KB Output repository, you must set up the environment by completing the following steps:

Table 25: Checklist for configuring IMS Tools KB for IMS HP Image Copy

Status	Task
	1. Set up an IMS Tools KB server by following the instructions in the *IMS Tools Base Configuration Guide*.
	2. Register IMS HP Image Copy to the registry of the IMS Tools KB server. See "Registering products and reports to IMS Tools KB" on page 56 and "Verifying product information registered to IMS Tools KB" on page 56.
	3. If needed, add the RECON.
	4. Ensure that the IMS Tools KB server is properly initialized before you run IMS HP Image Copy jobs. See "Verifying communication with the IMS Tools KB server" on page 56.
	5. Request IMS HP Image Copy to store reports in the IMS Tools KB repository by adding keywords to IMS HP Image Copy JCL. See "Requesting IMS HP Image Copy write reports to the IMS Tools KB repository" on page 56.

For detailed procedures, see the *IMS Tools Base Configuration Guide*.

Storing IMS HP Image Copy reports generated in jobs of other IMS Tools

IMS Online Reorganization Facility

To store IMS HP Image Copy reports and IMS HP Pointer Checker reports in the IMS Tools KB repository in IMS Online Reorganization Facility jobs, specify the IMS Tools KB server name by using one of the following keywords:

- When you process HALDBs, specify the server XCF group name on the ITKBSERVER keyword in HRFSYSIN DD. The ITKBSRVR keyword in ICEIN DD or in the IMS HP Image Copy site default table is not effective for HALDBs. If you do not specify the ITKBSERVER keyword, and if the ITKBSRVR keyword is specified in ICEIN DD or in the IMS HP Image Copy site default table, a warning message (FABJ0221W) is issued.
- When you process non-HALDBs, specify the server XCF group name either on the ITKBSRVR keyword in ICEIN DD or on the ITKBSERVER keyword in HRFSYSIN DD. The ITKBSRVR keyword in the IMS HP Image Copy site default table is also effective.

IMS Database Reorganization Expert

For information about storing the reports of IMS HP Image Copy and IMS HP Pointer Checker in the IMS Tools KB repository in IMS Database Reorganization Expert jobs, see the *IMS Database Reorganization Expert User's Guide*.

IMS HP Fast Path Utilities

For information about storing IMS HP Image Copy reports in the IMS Tools KB repository in IMS HP Fast Path Utilities jobs, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

Registering products and reports to IMS Tools KB

To store IMS HP Image Copy reports in the IMS Tools KB repository, you must register the product and its reports with IMS Tools KB.

Procedure

- Use the IMS Tools Knowledge Base product administration utility (HKTAPRA0) to register IMS HP Image Copy and its reports to IMS Tools KB. Follow the instructions in the topic "Registering IMS Tools products" in the *IMS Tools Base Configuration Guide*. The product registration JCL for IMS HP Image Copy is in the SHPSSAMP data set, member FABJITKB.

Verifying product information registered to IMS Tools KB

After you complete the registration of IMS HP Image Copy with IMS Tools KB, you must confirm the registered information, which includes the retention setting information for the reports.

About this task

You complete this task by using the reports service ISPF user interface of IMS Tools KB.

Procedure

1. Start the ISPF interface.
2. Select the **Administration** pull-down menu on the main panel.
3. Select option 2, **List Installed Products** to show the Installed Product List panel.
4. In the Installed Product List panel, confirm that the following product entry exists:

   ```
   Product Name: IBM IMS High Performance Image Copy for z/OS, Product Release: 040200
   ```

5. If necessary, change the retention setting for the registered reports.
   Check the retention setting for the registered reports. If you want to change the retention setting for the reports, follow the instructions in the topic "Report administration" in the *IMS Tools Base IMS Tools Knowledge Base User's Guide and Reference*.

Verifying communication with the IMS Tools KB server

Verify that the systems on which you run IMS HP Image Copy have XCF communications with the IMS Tools KB server and that the FPQ subsystem is started on each of these systems.

Procedure

- See the topic "Verifying the IMS Tools Knowledge Base installation" in the *IMS Tools Base Configuration Guide*.

Requesting IMS HP Image Copy write reports to the IMS Tools KB repository

After you verify the communication with the IMS Tools KB server, request IMS HP Image Copy to store reports in the IMS Tools KB repository.

Procedure

- Specify the ITKBLOAD and ITKBSRVR keywords of the IMS HP Image Copy ICEIN control statement. These keywords direct IMS HP Image Copy to communicate with the IMS Tools KB server so that IMS HP Image Copy reports can be stored in the IMS Tools KB repository.
  To store IMS HP Image Copy and IMS HP Pointer Checker reports that are generated in IMS HP Image Copy processes invoked in other IMS Tools jobs, see “Storing IMS HP Image Copy reports generated in jobs of other IMS Tools” on page 55.

  After you complete all the configuration steps for IMS Tools KB server, you can use the ISPF user interface to view, print, and manage IMS HP Image Copy reports that are stored in the IMS Tools KB

repository. For more information, see the *IMS Tools Base IMS Tools Knowledge Base User's Guide and Reference*.

Starting the DFSMSdss server address space

IMS HP Image Copy executes in a multiple address space environment. The main job can be submitted by the user or a job scheduler, or initiated as a started task.

About this task

Advanced Image Copy Services of IMS HP Image Copy schedules the DFSMSdss program (server) and uses its application programming interface (API). The DFSMSdss server runs in a different address space from the address space of IMS HP Image Copy. When a batch job starts, it starts the DFSMSdss server address space. The server remembers which job started the server. While the server is running, it accepts other connections until the originating job ends. At the end of the originating job, the job notifies the server that it has finished and this notification alerts the server that it can stop. Until the DFSMSdss address space is stopped, the address space is reused by the DFSMSdss API.

You can also start the DFSMSdss server within IMS HP Image Copy jobs. When the server is started, the server can be used by other applications that run in the same system.

> **Tip:** The DFSMSdss server address space simplifies the running of multiple jobs. Consider starting the DFSMSdss server address space in the system whenever possible.

Procedure

To start the DFSMSdss server address space within an IMS HP Image Copy job, follow these steps:

1. Create the following started task procedure and add it to SYS1.PROCLIB.

```
//*******************************************************************
//*   THIS PROCEDURE WILL CREATE AN APPROPRIATE DFSMSDSS CROSS       *
//*   MEMORY SERVER TO BE USED WITH APPLICATIONS THAT INVOKE CROSS   *
//*   MEMORY REQUESTING THE DEFAULT DFSMSDSS SERVER NAME.            *
//*                                                                  *
//*   TO USE, ENTER THE FOLLOWING AT A CONSOLE:                      *
//* START DFSMSDSS,PROG=ADRXMAIB                                     *
//*                                                                  *
//*   WHEN THE DFSMSDSS CROSS MEMORY SERVER IS NO LONGER REQUIRED    *
//*   ISSUE THE FOLLOWING MODIFY COMMAND:                            *
//* F DFSMSDSS,STOP                                                  *
//*                                                                  *
//*******************************************************************
//DFSMSDSS PROC PROG=IEFBR14
//IEFPROC  EXEC PGM=&PROG,REGION=0M,TIME=1440,DYNAMNBR=1635
```

2. Start the DFSMSdss server address space by using either of the following methods:
   - Issue the following command:

     ```
     S DFSMSDSS,PROG=ADRXMAIB
     ```

   - Add the procedure as a started task in your IPL procedure.
3. When the DFSMSdss server address space is started, run the IMS HP Image Copy jobs.
4. When your IMS HP Image Copy jobs end, and if you want to stop the server address space, issue the following command:

   ```
   F DFSMSDSS,STOP
   ```

Commands and required access levels for RACF® APPL resource class authority

IMS HP Image Copy issues various commands. Make sure that your user ID has the required authority to issue these commands.

IMS commands and their corresponding required access levels for RACF® APPL resource class authority are shown here.

IMS commands

The following table summarizes the IMS commands that are used in IMS HP Image Copy jobs and the access levels that are required to issue the commands.

Table 26: IMS commands

Command	Access level required
/DBDUMP	Update
/DBRECOVERY	Update
/DISPLAY	Read
/START	Read
QUERY	Read
UPDATE	Update

DBRC API and DBRC commands

The following table summarizes the DBRC API and DBRC commands that are used in IMS HP Image Copy jobs and the access levels that are required to issue the commands.

Table 27: DBRC API and DBRC commands

Command	Access level required
DBRC API - QUERY	Update
DBRC API - RELBUF	Update
DBRC API - START/STOP	Read
DBRC API - STARTDBRC/STOPDBRC	Update
DBRC Command - CHANGE	Update
DBRC Command - DELETE	Update
DBRC Command - LIST	Read
DBRC Command - NOTIFY	Update

For more information about issuing these commands, see the following topics:

- Topics about DBRC security in *IMS System Administration*
- Topics about DBRC API security features in *IMS System Programming APIs*

To set RACF® control information for these IMS commands, DBRC API commands, and DBRC commands, see *IMS Commands* for the version of IMS that you are using.

Setting default values for the FABJMAIN program

The IMS HP Image Copy Site Default Generation utility enables you to set your own default values for the GLOBAL statement of the ICEIN data set.

The Site Default Generation utility creates a user site default table for the IMS HP Image Copy GLOBAL statement, and this table is used in every IMS HP Image Copy run. The input specification in the Site Default Generation utility is the same as the GLOBAL statement in ICEIN DD. The generated site default table is used by stand-alone IMS HP Image Copy and also by the IMS HP Image Copy process that is invoked by other IMS Tools products.

The Site Default Generation utility analyzes ICEIN GLOBAL statements and generates a source code for the site default table. To use the site default table, the library for the site default table module (FABJGLB0) must be concatenated to the STEPLIB DD of FABJMAIN runtime JCL.

If FABJMAIN finds the name FABJGLB0 in the STEPLIB libraries, IMS HP Image Copy loads the module and uses the values as default values for the GLOBAL statement.

If you specify a value in the GLOBAL statement of ICEIN DD, you can override the site default value at run time. When the GLOBAL statement is specified in the ICEIN DD of the runtime JCL, the value of the GLOBAL statement is used.

The following figure shows the process flow for creating and using the GLOBAL site default table.

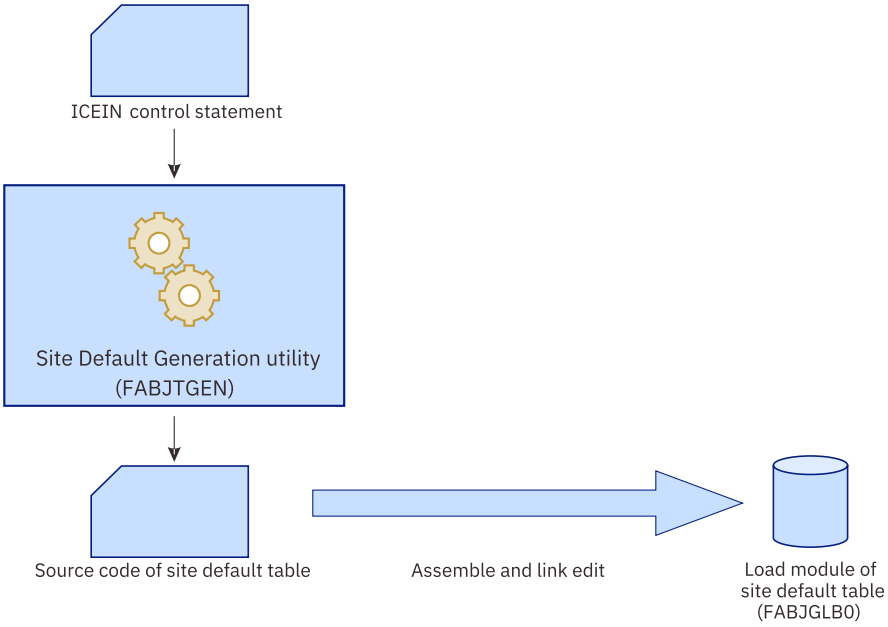


Figure 9: Creating and using the GLOBAL site default table

Specifying site default values for the FABJMAIN program

To set site default values for the GLOBAL statement, you use the FABJTGEN program to create the source code for the site default table and assemble and link-edit the source code.

Procedure

1. Run the IMS HP Image Copy Site Default Generation utility (FABJTGEN) to create source code for the site default table (FABJGLB0). To run FABJTGEN, do as follows:
   a. Code the EXEC statement.
   The EXEC statement must be in the following form:

   ```
   //        EXEC PGM=FABJTGEN,REGION=nM
   ```

   b. Supply DD statements. See "DD statements for the Site Default Generation utility" on page 60.
   c. Specify the ICEIN keywords and their parameters that you want to use as the site default values.
   d. Submit the JCL.
2. Assemble and link the FABJGLB0 source code.
   This procedure has two steps: Assemble and link-edit to create the site default table module from the assembler source.

   The input assembler source is generated by FABJTGEN. Both the module name and the entry name of the site default table must be FABJGLB0.

   Link-edit the site default table module with the following options:

   - AMODE=24
   - RMODE=24

- REUSE

JCL sample (FABJDFLJ) that generates the site default table module is provided in the SHPSSAMP data set.

3. Concatenate the load module library in which FABJGLB0 resides to the STEPLIB of the IMS HP Image Copy FABJMAIN JCL.

DD statements for the Site Default Generation utility

The Site Default Generation utility requires DD statements to identify the source of input and the placement of output information.

The following table lists the DD statements that you can use for the FABJTGEN JCL.

Table 28: DD statements for the FABJTGEN JCL

DDNAME	Use	Format	Required or optional
STEPLIB	Input	PDS	Optional
ICEIN	Input	LRECL=80	Required
SYSPUNCH	Output	LRECL=80	Required
SYSPRINT	Output	LRECL=133	Required
SYSABEND or SYSUDUMP	Output	LRECL=133	Optional

STEPLIB DD

This statement points to the load module library data set that contains the IMS HP Image Copy load modules.

ICEIN DD

This statement is required. It specifies the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input stream (DD * or DD DATA).
For details, see "ICEIN control statements" on page 154.

SYSPUNCH DD

This statement is required. It specifies the output data set for FABJTGEN to generate the assembler source code. The following DCB parameters must be specified:

- RECFM=F or FB
- LRECL=80
- BLKSIZE=80 or multiple of 80

SYSPRINT DD

This statement is required. It specifies the output message data set. The data set can reside on a tape, a direct-access volume, or a printer; or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 121.

SYSABEND DD

SYSUDUMP DD

These statements define a dump data set. If both statements are present, the last occurrence is used for the dump.

Supported keywords for the Site Default Generation utility

The keywords for the ICEIN utility control statement are a required input for the Site Default Generation utility. This topic summarizes the keywords that can be used for the Site Default Generation utility.

The Site Default Generation utility analyzes only the GLOBAL statement. If other statements (GROUP, IC, AIC, CIC, ACIC, RCV, or CRC) are specified, they are ignored.

The following keywords can be used for the Site Default Generation utility.

Table 29: Keywords for the Site Default Generation utility

- ADXCFGRP
- BYPDBAUTH
- CAUNIT
- CIC_KSDS
- COMP
- COMPMODE
- COMPRTN
- CRCTYPE
- DATACLAS
- DATACLAS2
- DATACLAS3
- DATACLAS4
- DATACLAS5
- DATACLAS6
- DATACLAS7
- DATA_MOVER
- DBALL
- DBBUF
- DBRC
- DEDBPC
- DEL_ICDS
- DRSNDSN
- DSBUF
- DSN
- DSN2
- DSN3
- DSN4
- DSN5
- DSN6
- DSN7
- DSNTYPE
- DSSTEMP
- DYNA_RETRY
- EMPOSAM
- EXTENT
- FALLBACK
- FASTIC
- GDGBASE
- GDGLIMIT
- GROUPDIGITS
- GRPLIM
- HDPC
- HOMECHK
- HPIO
- ICBUF
- ICCAT
- ICDALLOC
- ICHLQ
- ICHLQ2
- ICHLQ3
- ICHLQ4
- ICHLQ5
- ICHLQ6
- ICHLQ7
- ICNMRULE
- ICOUT
- ICUNIT
- IC_ERROR
- IDXSRCH
- IGNORCAT
- ITKBLOAD
- ITKBSRVR
- IXKEYCHK
- KEYLABEL
- LBI
- LOGUNIT
- LOGUSE
- MGMTCLAS
- MGMTCLAS2
- MGMTCLAS3
- MGMTCLAS4
- MGMTCLAS5
- MGMTCLAS6
- MGMTCLAS7
- MSGFREQ
- NOREUSE
- NOTIFY
- NOTIFYMODE
- OFFLDSTACK
- OFFLDTYPE
- RECALL
- REGTIMESTMP
- RESTART
- RETCDDSN
- RETPD
- RETPD2
- RETPD3
- RETPD4
- RETPD5
- RETPD6
- RETPD7
- RSTTYPE
- RSTTYPE_STK
- SENSOR
- SENSOR_HOME
- SHDWDELETE
- SHDWDSN
- SHDWHLQ
- SHDWMGMTCL
- SHDWSTORCL
- SHDWTCTL
- SPACE
- SPMN
- STACK
- STACKBASE
- STORCLAS
- STORCLAS2
- STORCLAS3
- STORCLAS4
- STORCLAS5
- STORCLAS6
- STORCLAS7
- TASKCTL
- THRESHOLDS
- TIMECHK
- TIMESTMP (See Note)
- TOIAUTO
- TOIAUTO_Q
- TOIAUTO_STA
- TOIRETRY
- TOITIME
- TOITIME_Q
- TOIXCFGR
- TOSIXCFGRP
- T2CHK
- UNIT
- USER
- VIC
- VICDSN
- VOLCNT
- WAITALOC
- WAITMSG
- WAITTIME
- ZIIPMODE

Note: For the site default, the TIMESTMP keyword supports only the LASTIC and the LASTICALL parameters.

If you omit one or more of these keywords, the IMS HP Image Copy original default values are kept as the default for the omitted keywords.

If other keywords for GLOBAL statement are specified in the ICEIN GLOBAL statement, the Site Default Generation utility ignores them.

Generating JCL by using the GENJCL command

The following topics describe considerations for using the GENJCL DBRC commands.

GENJCL for the Image Copy function

You can use IMS GENJCL DBRC commands to generate JCL and utility control statements needed to run the Database Image Copy utility or the Image Copy function with IMS compatible JCL.

The JCL and utility control statements generated by IMS GENJCL commands cannot be used for the Image Copy function run with the FABJMAIN program.

The following diagram shows the data flow of the GENJCL DBRC commands.

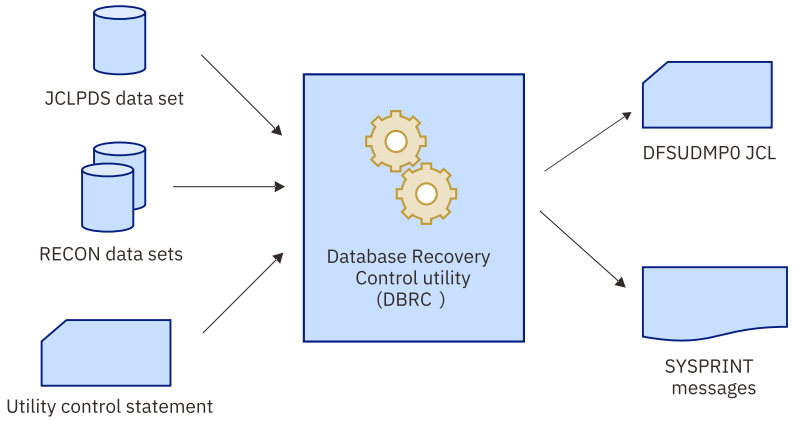


Figure 10: GENJCL.IC overview

The input to DBRC consists of the following resources:

- The DBRC command
- RECON
- PDS, which contains the JCL and control statements for the utility that DBRC uses to generate a job
- The data set that contains the database descriptions for the databases that are to be placed under the control of DBRC

The output from DBRC consists of the following resources:

- Jobs created by GENJCL commands
- RECON, which might have been updated by the utility
- One or more of the following resources:
  - A listing of the input commands
  - Informational messages that are associated with their execution or diagnostic messages that explain any failures and return codes
  - A listing of each job that was created with GENJCL commands

The following considerations apply to the Image Copy function:

- On the STEPLIB DD statement, specify the library in which the Image Copy function modules reside.
- Generate correct utility control statements for the Image Copy function. These statements are different from those used for the original Image Copy function with the compression exit.

- For possible HASH Check invocation, specify the DD statements that are required for the HASH Check option.

GENJCL.IC

After considering the points discussed in "GENJCL for the Image Copy function" on page 62, do the following to generate Image Copy function JCL:

1. Write a skeletal JCL member for the Image Copy function. A sample skeletal JCL member is listed in "Figure: Sample skeletal JCL FABJICS0" on page 63. You must place skeletal JCL members in your JCLPDS library.
   - Specify the libraries that contain the modules of Image Copy function and HD Pointer Checker.
   - Specify Y, N, or a blank for position 39 in the SYSIN DD statement. Use the keyword %COMP to specify this. You can specify any user-defined keywords like this within the DBRC convention. User-defined keywords are replaced by values in an appropriate default member when the JCL is generated.
   - Specify the DD statements for the HASH Check option.

   Figure 11: Sample skeletal JCL FABJICS0

```
//IC%STPNO  EXEC PGM=DFSUDMP0,REGION=800K
//*
//*      JCL FOR IMAGE COPY WITH HPIC DATA COMPRESSION
//*
//STEPLIB   DD DSN=HPS.SHPSLMD0,DISP=SHR
//          DD DSN=IMSESA.SDFSRESL,DISP=SHR
//SYSPRINT  DD SYSOUT=A
%DELETE  (%RCNDSN1 EQ '')
//RECON1    DD DSN=%RCNDSN1,DISP=SHR
%ENDDEL
%DELETE  (%RCNDSN2 EQ '')
//RECON2    DD DSN=%RCNDSN2,DISP=SHR
%ENDDEL
%DELETE  (%RCNDSN3 EQ '')
//RECON3    DD DSN=%RCNDSN3,DISP=SHR
%ENDDEL
//IMS       DD DSN=IMSESA.DBDLIB,DISP=SHR
%SELECT  DBDS((%DBNAME,%DBDDN))
%DELETE  (%DBADSAV NE 'AVAIL')
//%DBADDN   DD DSN=%DBDSN,DISP=OLD
%ENDDEL
%DELETE  (%DBADSAV NE '')
//%DBDDN    DD DSN=%DBDSN,DCB=BUFNO=10,DISP=OLD
%ENDDEL
%ENDSEL
//DATAOUT1  DD DSN=%ICDSN1,UNIT=%ICUNIT1,
//             VOL=(PRIVATE,,,%ICVCNT1,SER=(%ICVOLS1)),
//             LABEL=(%ICFSEQ1,SL),
//             DISP=(NEW,KEEP),DCB=BUFNO=10
%DELETE  (%COPIES EQ '1')
//DATAOUT2  DD DSN=%ICDSN2,UNIT=%ICUNIT2,
//             VOL=(PRIVATE,,,%ICVCNT2,SER=(%ICVOLS2)),
//             LABEL=(%ICFSEQ2,SL),
//             DISP=(NEW,KEEP),DCB=BUFNO=10
%ENDDEL
//SYSIN     DD *
%DELETE  (%COPIES EQ '2')
D1 %KDBN %KDDN DATAOUT1         %COMP
%ENDDEL
%DELETE  (%COPIES EQ '1')
D2 %KDBN %KDDN DATAOUT1 DATAOUT2%COMP
%ENDDEL
/*
%DELETE  (%HASH NE 'Y')
//DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL
//PRIMAPRT DD SYSOUT=A
//STATIPRT DD SYSOUT=A
//VALIDPRT DD SYSOUT=A
//SNAPPIT  DD SYSOUT=A
//FSESTAT  DD DISP=(NEW,DELETE,DELETE),UNIT=SYSDA,
//            SPACE=(CYL,(1,1))
//SORTEX   DD DISP=(NEW,CATLG,DELETE),UNIT=SYSDA,
```

```
//            SPACE=(CYL,(1,1)),
//            DSN=HPS.%DBNAME.%DBDDN.SORTEX
%ENDDEL
```

2. Write a default member containing the default values to be replaced by the user-defined keywords. When JCL is generated, the user-defined keywords in skeletal JCL member ("Figure: Sample skeletal JCL FABJICS0" on page 63) are replaced with values in the appropriate default member. "Figure: Default member FABJICD1" on page 64 shows a sample default member FABJICD1.
Figure 12: Default member FABJICD1

```
    GENJCL.IC DEFAULT MEMBER FOR HPIC IMAGE COPY FUNCTION
    DEFAULT MEMBER NAME (FABJICD1)

     IF YOU WISH TO USE:
        - DATA COMPRESSION FOR IC RECORDS
        - HDPC HASH CHECK OPTION
     FOR TAKING IMAGE COPY BY GENJCL.IC, REFER TO THIS DEFAULT MEMBER
     AND THE 'FABJICS0' SKELETAL JCL MEMBER OF THE DISTRIBUTED
     SAMPLE JCL LIBRARY.

     TO USE THIS DEFAULT MEMBER, YOU ARE REQUIRED TO SPECIFY
     DEFLTJCL(FABJICD1) ON INIT.DBDS COMMAND OR DEFAULTS(FABJICD1)
     ON GENJCL.IC COMMAND.

     SAMPLE GENJCL.IC COMMAND FORMAT ARE:

      1. IF YOU WANT TO COMPRESS IMAGE COPY,

        GENJCL.IC DBD(DBDNAME1) DDN(DDNAME1)


      2. IF YOU WANT TO COMPRESS IMAGE COPY AND INVOKE THE
         HASH FUNCTION,

        GENJCL.IC DBD(DBDNAME1) DDN(DDNAME1) -
        USERKEYS((%HASH,'Y'))


      3. IF YOU DO NOT WANT TO COMPRESS IMAGE COPY,

        GENJCL.IC DBD(DBDNAME1) DDN(DDNAME1) -
        USERKEYS((%COMP,' '))

     DEFAULT VALUES:

     FOLLOWING DEFAULT VALUES SUBSTITUTE FOR THE SIMPLE KEYWORDS
     DEFINED IN THE SKELETAL JCL EXECUTION MEMBER 'FABJICS0'.

%KDBN='DBDNAME1'     DBNAME MUST BE 8 CHARACTERS
%KDDN='DDNAME1 '     DBDDN MUST BE 8 CHARACTERS
%COMP='Y'            COMPRESSION: YES
%HASH='N'            HASH CHECK: NO
```

Specify DBDNAME to replace %KDBN. Add blanks to fill any character string that has fewer than 8 characters.

Specify DDNAME to replace %KDDN. As in "Figure: Default member FABJICD1" on page 64, blanks must be added to any character string of fewer than 8 characters.

Specify Y, N, or a blank to replace %COMP-Y for IMS HP Image Copy with compression; N or a blank for IMS HP Image Copy without compression.

Specify Y, N, or a blank to replace %HASH-Y for IMS HP Image Copy with the HD Pointer Checker HASH evaluation; N or a blank for IMS HP Image Copy without the HD Pointer Checker HASH evaluation.

3. Register the members to the RECON data set.
   a. Initialize the RECON data set and register the required information to it. For details about initialization, registration, and modification of RECON, see *IMS System Utilities*.
   b. Register to the RECON data set the name of the skeletal JCL member and the default member you want to use.
      Use the INIT.DBDS command to register the names. The ICJCL parameter specifies the name of the skeletal JCL member. The DEFLTJCL parameter specifies the name of the default JCL member.

```
INIT.DBDS   DBD(db1) DDN(dd1)    -
            DSN(dsn1) GENMAX(n)  -
            ICJCL(FABJICS0) DEFLTJCL(FABJICD1)
```

where *n*=2-255.

4. Run the GENJCL.IC command to generate the JCL for the Image Copy function.

```
GENJCL.IC DBD(db1) DDN(dd1)
```

The DBRC uses the skeletal JCL and the default JCL that are registered to the RECON to generate the JCL for the Image Copy function.

The following is the resulting IMS HP Image Copy control statement:

```
//SYSIN     DD *
D1 DB1      DD1      DATAOUT1         Y
/*
```

GENJCL with the GROUP parameter

You can generate multiple JCL for the Image Copy function by using the GROUP parameter of the GENJCL.IC command:

1. Write a skeletal JCL member for the Image Copy function. See step "1" on page 63.
2. Define DBDSGRP, a group of database data sets to be processed together as a DBDS group in RECON:

```
INIT.DBDSGRP   GRPNAME(dbdsg1)    -
               MEMBERS((db1,dd1),(db2,dd2),.....)
```

3. Write a default member for each database data set, containing the default values to replace the user-defined keywords. When JCL is generated, the user-defined keywords in the skeletal JCL member ("Figure: Sample skeletal JCL FABJICS0" on page 63) are replaced with values of an appropriate default member. One default member is required for each database data set in the group. "Figure: Default member FABJICD2" on page 65 shows a sample default member FABJICD2. You can use FABJICD1 shown in "Figure: Default member FABJICD1" on page 64 for *db1*, and FABJICD2 for *db2*.
Figure 13: Default member FABJICD2

```
  GENJCL.IC DEFAULT MEMBER FOR HPIC IMAGE COPY FUNCTION
  DEFAULT MEMBER NAME (FABJICD2)

   IF YOU WISH TO USE:
       - DATA COMPRESSION FOR IC RECORDS
       - HDPC HASH CHECK OPTION
   FOR TAKING IMAGE COPY BY GENJCL.IC, REFER TO THIS DEFAULT MEMBER
   AND THE 'FABJICS0' SKELETAL JCL MEMBER OF THE DISTRIBUTED
   SAMPLE JCL LIBRARY.

   TO USE THIS DEFAULT MEMBER, YOU ARE REQUIRED TO SPECIFY
   DEFLTJCL(FABJICD2) ON INIT.DBDS COMMAND OR DEFAULTS(FABJICD2)
   ON GENJCL.IC COMMAND.

   SAMPLE GENJCL.IC COMMAND FORMAT BY GROUP ARE:

    1. YOU ARE REQUIRED TO SPECIFY GRPNAME AND MEMBERS PARAMETERS ON
       INIT.DBDSGRP COMMAND TO DEFINE A GROUP OF DBDSS TO DBRC.

      INIT.DBDSGRP  GRPNAME(DBDSGLP)    -
                    MEMBERS((DBDNAME1,DDNAME1),(DBDNAME2,DDNAME2))

    2. IF GROUP IS SPECIFIED, THE GENJCL.IC COMMAND IS EXECUTED
       REPEATEDLY FOR EACH DBDS OF THE DBDS GROUP.

       GENJCL.IC GROUP(DBDSGLP)

    DEFAULT VALUES:

    FOLLOWING DEFAULT VALUES SUBSTITUTE FOR THE SIMPLE KEYWORDS
    DEFINED IN THE SKELETAL JCL EXECUTION MEMBER 'FABJICS0'.
```

```
DBDNAME2'     DBNAME MUST BE 8 CHARACTERS
DDNAME2 '     DBDDN MUST BE 8 CHARACTERS
Y'            COMPRESSION: YES
N'            HASH CHECK: NO
```

4. Register the members to the RECON data set for each database data set.

```
INIT.DBDS   DBD(db1) DDN(dd1)    -
            DSN(dsn1) GENMAX(n)  -
            ICJCL(FABJICS0) DEFLTJCL(FABJICD1)
INIT.DBDS   DBD(db2) DDN(dd2)    -
            DSN(dsn2) GENMAX(n)  -
            ICJCL(FABJICS0) DEFLTJCL(FABJICD2)
```

   where *n*=2-255.

5. Run GENJCL for the DBDSGRP:

```
GENJCL.IC GROUP(dbdsg1)
```

GENJCL for the Recovery function

You must specify the library of the Recovery function to the STEPLIB DD statement. No additional process is required to run GENJCL.RECOV for the Recovery function.

The input image copy data set contains the compression information in its Image Copy header record. You do not have to specify whether or not to use a compression routine in executing the database recovery.

Running IMS HP Image Copy

The following topics explain how to use the functions of IMS HP Image Copy with the FABJMAIN program.

Topics:

- "Taking image copies" on page 67
- "Recovering databases" on page 116
- "Creating new image copies from an image copy" on page 125
- "Pointer checking online full-function databases" on page 141
- "Control statements and keywords" on page 154
- "Allocating data sets dynamically" on page 275
- "Advanced Image Copy Services" on page 288
- "IMS HP Image Copy reports" on page 295

Taking image copies

The following topics explain how to take image copies with the Image Copy function by using the FABJMAIN program.

Topics:

- "Features for the Image Copy function" on page 67
- "Considerations for the Image Copy function" on page 69
- "Restrictions for the Image Copy function" on page 72
- "Running the Image Copy function" on page 75
- "DD statements for the Image Copy function" on page 83
- "Control statement keywords for the Image Copy function" on page 90
- "Multiple-step HASH Check option reference" on page 102
- "Examples for the Image Copy function" on page 106

Features for the Image Copy function

The Image Copy function that is run by the FABJMAIN program supports the features summarized in the following table.

Many of the features are enabled by ICEIN control statement keywords. For a list of ICEIN control statements, see "Control statement keywords for the Image Copy function" on page 90.

Table 30: Features for the Image Copy function

Feature	Description
Batch image copy and concurrent image copy	IMS HP Image Copy supports two types of image copy processing; batch image copy and concurrent image copy. For more information, see the following topics: • "IC/AIC statement" on page 156 • "CIC/ACIC statement" on page 156 • "FUNC keyword" on page 192

Feature	Description
Compressed image copy	A compressed image copy has the format of database records that are compressed by one of the IMS HP Image Copy compression routines. The advantage of this format is that it reduces allocation space for output image copy.
Fast Recovery image copy	A Fast Recovery image copy helps you recover database data sets quickly, reducing the total recovery time and the time that the database is unavailable.
Advanced Image Copy Services	Advanced Image Copy Services of IMS HP Image Copy allows you to take advantages of point-in-time copy functions (Concurrent Copy, FlashCopy®, and SnapShot) of DFSMSdss Advanced Copy Services to produce image copies faster and reduce unavailability time for IMS databases.
High Performance Input/ Output interface	The High Performance Input/Output (HP Input/Output or HPIO) interface reduces CPU time and usage while IMS HP Image Copy generates image copies or recovers a database.
Parallel processing	The Image Copy function can process more than one database data sets in parallel. Processing tasks in parallel decreases elapsed processing time. For more information, see the following topics: • "IC/AIC statement" on page 156 • "CIC/ACIC statement" on page 156 • "FUNC keyword" on page 192
Database group processing	In database group processing, all database data groups and areas that are registered to a change accumulation (CA) group or a database data set (DBDS) group in DBRC are processed. For more information, see "GROUP statement" on page 155.
Dynamic allocation	IMS HP Image Copy can dynamically allocate input and output data sets, such as database data sets, image copy data sets, log data sets, and change accumulation data sets. You do not need to provide a DD statement for each data set.
Stacking output image copies	Places two or more image copy data sets on the same tape or on a set of tapes (stacking) to increase the tape media efficiency.
Database pointer check (HASH Check)	The Image Copy function can check the accuracy of database pointers while it creates image copies. By enabling the Hash Check option, you need only to take image copies instead of running pointer check utilities to verify the pointers of databases. You can reduce the number of jobs for verifying the pointers of image copies taken.
Checkpoint Restart	This option provides Checkpoint Restart capabilities for the Image Copy function. You can use the Checkpoint Restart option to reprocess failed image copies without reprocessing previously successful image copies by rerunning the same JCL stream that is used in the previous run.
Index database search	The Image Copy function searches for related index databases automatically and creates image copies.
Logical relation search	The Image Copy function searches for all the databases that are logically related with the specified database, all the index databases that are defined for the specified database, and all the index databases that are defined for the identified logically related databases.
Creating multiple image copies at one time	The Image Copy function can create multiple image copy data sets in one run.
Collecting sensor data	The Image Copy function can start Integrated DB Sensor to collect sensor data during the image copy job.
Site Default Generation utility	The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs. For more information, see "Specifying site default values for the FABJMAIN program" on page 59.

Feature	Description
Integration with IMS Tools Online System Interface	Using the IMS Tools Online System Interface ensures that the database being image copied is available and in the appropriate state. Time is saved because you need not manually bring the database down prior to image copy and up again after the image copy is complete.
Central management of reports	IMS HP Image Copy supports the function of the IMS Tools KB Output repository, which enables you to store the reports that are generated by IMS HP Image Copy jobs. The use of IMS Tools KB Output repository helps you simplify management of IMS HP Image Copy reports.
Offloading workload to zIIP processors	IMS HP Image Copy supports the IBM® System z® Integrated Information Processor (zIIP) to offload eligible database workloads.

Considerations for the Image Copy function

Certain considerations apply to using the Image Copy function with the FABJMAIN program.

Subtopics:

- "General considerations" on page 69
- "Considerations when the IMS management of ACBs is enabled" on page 69
- "Considerations for HALDB (high availability large database)" on page 69
- "Considerations for creating image copies of IMS catalog" on page 70
- "Considerations for dynamically allocating output image copy data sets" on page 70
- "Considerations for Advanced Image Copy Services" on page 70
- "Considerations for parallel processing" on page 71
- "Considerations for enabling logical relation search" on page 71
- "Considerations for Fast Path secondary indexes" on page 71
- "Considerations for single-step HASH Check (for full-function databases)" on page 71
- "Considerations for multiple-step HASH Check (for full-function databases)" on page 72
- "Considerations for DEDB HASH Check" on page 72
- "Considerations for DB Sensor" on page 72

General considerations

If the target databases have shared index databases, Image Copy function job with IDXSRCH=Y option (searches for related index DBDS) or DBALL=Y option (search for logical group DBDS) might end with an error. To avoid this error, you must specify IDXSRCH=N or DBALL=N, and write an ICEIN statement for the shared index database.

Considerations when the IMS management of ACBs is enabled

To run the Image Copy function in an IMS-managed ACBs environment, the following requirements must be met:

- The IMS catalog is registered to the DBRC RECON data sets.
- If IMS HP Image Copy needs to access control blocks from the IMS catalog, CATALOG=YES and ACBMGMT=CATALOG are specified in the IMS Catalog Definition exit routine (DFS3CDX0).

In the IMS-managed ACBs environment, multiple-step HASH check for full-function databases is not supported.

Considerations for HALDB (high availability large database)

The following considerations apply when processing a HALDB:

- DBRC=Y is required for creating image copies of a HALDB.
- Image copies of the HALDB primary index and indirect list data sets (ILDSs) are not created.

    - If you specify the DBD name of the HALDB master or a partition name without the database data set name in the IC, AIC, CIC, or ACIC statement, IMS HP Image Copy does not create image copies of the primary index and ILDS data sets.
    - If you specify the database data set name of the primary index or ILDSs in the IC, AIC, CIC, or ACIC statement, the process ends with an error.
    - If you specify the database data set group (DBDS group) or the CA group of DBRC and if the primary index and ILDSs belong to that group, IMS HP Image Copy does not create image copies of the primary index and ILDS data sets.
- Image copies cannot be created for a partition data set while the integrated HALDB Online Reorganization function is reorganizing the partition.

Considerations for creating image copies of IMS catalog

The following considerations apply when creating image copies of the IMS catalog:

- IMS catalog must be registered to DBRC.
- DBRC=Y is required for creating image copies of the IMS catalog.
- If you enable the HD Pointer Checker HASH Check option, all partition data sets of the IMS catalog must be processed in the same job step.
- If the IMS management of ACBs is enabled, image copies of the following additional system data sets, which are used to manage ACBs, are not created:
    - IMS directory data sets
    - Bootstrap data set
    - Staging data set

Considerations for dynamically allocating output image copy data sets

If generation data group (GDG) is enabled, the oldest generation data set is deleted when the maximum number of generation data sets is reached. This is true even when the Image Copy function fails to create image copies successfully. For more information, see “Attention: Oldest GDG data set might be deleted” on page 276.

Considerations for Advanced Image Copy Services

- When creating Fast Recovery image copy, only a single output image copy can be created, and the image copy must reside on DASD. To create multiple output image copies, you specify OFFLDTYPE=S or OFFLDTYPE=F.
- If you specify OFFLDTYPE=S or OFFLDTYPE=F and create multiple image copy data sets, IMS HP Image Copy registers up to two image copy data sets to the DBRC RECON data sets. If you use the GENJCL.RECOV command of DBRC to generate JCL for the Database Recovery utility (DFSURDB0), DBRC identifies the primary image copy data set but not the secondary image copy data set. To include secondary image copy data set in Database Recovery utility JCL, you must manually modify the JCL and add the DD statement for the secondary image copy data set.
- When OFFLDTYPE=S, the HASH Check option can be run while creating the secondary image copy.
- The output Fast Recovery image copy is registered to DBRC as SMSOFFLC or SMSONLC.

Considerations for concurrent image copy (CIC) process

- Database, database data sets, and area data sets must be registered to DBRC.
- DBRC must be used in the job (DBRC=Y).
- The following considerations apply if the database uses KSDS:
    - COPY and FDUMP options of Advanced Image Copy Services cannot be used.
    - Image copies, except for those created with the DUMP option of Advanced Image Copy Services, cannot be used for database recovery.
    - If you specify CIC_KSDS=N, the Image Copy function does not create image copies of KSDS.

Considerations for parallel processing

The following considerations apply to parallel processing:

Stack processing

- If STACK=*ddname* is used with parallel processing, IMS HP Image Copy serializes the processes for the same output DD.
- If STACK=*ddname* is used with GROUP processing, IMS HP Image Copy serializes all processes in the group even if you choose parallel processing.
- If STACK=* is used with parallel processing, the number of output data sets that IMS HP Image Copy controls depends on the number of subtasks.
- Image Copy data sets are stacked in more than one tape medium.

Group processing

- If you want to control subtasks in GROUP processing, code the GRPLIM keyword to control the number of subtasks.

Considerations for enabling logical relation search

To specify the DBALL option, which identifies all database data sets in the logical group, you must include the IMS HP Pointer Checker library in the STEPLIB DD concatenation.

Considerations for Fast Path secondary indexes

When you create image copies of Fast Path secondary indexes, the following considerations apply:

- The area data set that uses the secondary index database must be processed in the same job step. However, if FPINDEX=YES is specified in the DBD of the index database, the area data set does not have to be processed in the same job step.
- When FPINDEX=YES is not specified in the DBD and the area data set that uses the secondary index database is not processed in the same job step, IMS HP Image Copy treats the index database as a full-function index database. If HDPC=Y is specified, the HASH Check process ends abnormally.
- DEDB HASH Pointer Check cannot process Fast Path secondary indexes.

Considerations for single-step HASH Check (for full-function databases)

- The function cannot determine the location of pointer errors that are found during HASH Check. Run the Pointer to Segment Check function for the image copy data set in a stand-alone HD Pointer Checker job.
- A pointer value must correspond to the RBA of the segment to which the pointer points. Also, the sum of the pointer values for a specific pointer type must correspond to the sum of the RBAs of the given segment type.
- The locations of errors cannot be determined precisely.
- Theoretically, the errors in the pointer value, if there are any, are compensated for because it is the sum of the values that are actually compared. The probability of such a compensation, however, is extremely low.
- For non-HALDBs, you must specify all logically related databases and indexes in the same step of HASH Check. In that same step, if you prefer, you can also specify databases that are not logically related or that have no index relationships.
- Secondary index database can be checked.
  - The sum of RBA values in index pointer segments is checked with the sum of RBA of the index target segments when one of the following conditions is satisfied:
    - The index source segment equals to the index target segment.
    - The index target segment is the parent of the index source segment, and the source segment has a PP pointer. However, if the index source segment is split into the prefix and data, and sparse indexing is defined for the source segment, only the number of pointer segments is checked. The RBA values are not checked.
- Considerations for secondary indexes are as follows:

- If a secondary index database maintenance exit routine is defined for the source segment, store the load module in the IMS2 DD data set. If no load module is in the IMS2 DD data set, only the statistics reports are printed, but no pointer segment is checked.
- Segment edit/compression exit routine is not called by HD Pointer Checker, even if they are defined for the index source segment. Therefore, only the statistics report is printed, but no pointer segment is checked when one of the following conditions apply:
  - A segment edit/compression exit routine and a sparse indexing are defined for the source segment.
  - The source segment is of variable length, and a segment edit/compression exit routine is defined for it.
- The segments cannot be checked when some of the index source segments are suppressed, split to the prefix and data portions, and physically deleted. Thus, only the statistics reports are printed.
- HASH Check does not support PSINDEX databases. If a PSINDEX database is provided as an input, the Image Copy function creates image copies but IMS HP Pointer Checker issues a warning message and ignores the PSINDEX database. The Image Copy function continues processing the next database.

Considerations for multiple-step HASH Check (for full-function databases)

> **Attention:** In an IMS-managed ACBs environment, multiple-step HASH Check for full-function databases is not supported.

- The function cannot determine the location of pointer errors that are found during HASH Check. Run the Pointer to Segment Check function for the image copy data set in a stand-alone HD Pointer Checker job.
- A pointer value must correspond to the RBA of the segment to which the pointer points. Also, the sum of the pointer values for a specific pointer type must correspond to the sum of the RBAs of the given segment type.
- The locations of errors cannot be determined precisely.
- Theoretically, the errors in the pointer value, if there are any, are compensated for because it is the sum of the values that are actually compared. The probability of such a compensation, however, is extremely low.

Considerations for DEDB HASH Check

- The function cannot determine the location of pointer errors that are found during HASH Check. Use the Pointer to Segment Check function against the image copy data set in a stand-alone DEDB Pointer Checker job.
- A pointer value must correspond to the RBA of the segment to which the pointer points. The sum of the pointer values for a specific pointer type must also correspond to the sum of the RBAs of the given segment type.
- The location of errors cannot be determined precisely.
- Pointer value errors might theoretically compensate, but the probability of making such a compensation is extremely low.

Considerations for DB Sensor

To use DB Sensor, you must have IMS Database Solution Pack, IMS Fast Path Solution Pack, or IMS Database Utility Solution installed. DB Sensor is a function that IMS Database Solution Pack, IMS Fast Path Solution Pack, and IMS Database Utility Solution provide.

Restrictions for the Image Copy function

Certain restrictions apply to using the Image Copy function with the FABJMAIN program.

The following restrictions are common restrictions for IMS HP Image Copy functions:

- The FABJMAIN program can process only one IMS HP Image Copy function in one job-step execution.
- A HALDB requires that DBRC is active; otherwise a copy request is rejected.

- HSAM, GSAM, and MSDB databases are not supported.
- DD names that start with prefixes FABJ, ICE$, and HKT have special meaning to IMS HP Image Copy. Do not use DD statements with these prefixes except for the DD statements that are listed in "DD statements for creating image copies" on page 83.

Subtopics:

- "Restrictions for the Image Copy function" on page 73
- "Restrictions for the Advanced Image Copy Services" on page 73
- "Restrictions for parallel processing" on page 74
- "Restrictions for single-step HASH Check (for full-function databases)" on page 74
- "Restrictions for multiple-step HASH Check (for full-function databases)" on page 74
- "Restrictions for DEDB HASH Check" on page 75

Restrictions for the Image Copy function

- The Image Copy function supports the following environments only:
  - Batch image copy
  - Concurrent image copy
- The Image Copy function does not support the functions that are provided by the following IMS utilities:
  - Online image copy
  - HSSP image copy
  - Image copy 2
  - Restart function under UCF
- The same data set group, DBDS, or area cannot be processed in the same job step, which means, you cannot specify the same data set group, DBDS, or area in multiple ICEIN statements, such as IC and AIC, in the same job step.
  When you process shared secondary index databases, be aware that you can specify only one secondary index for each shared secondary index database in a job step. For example, as shown in the following figure, if a shared secondary index database has two secondary indexes with database names INDEX0 and INDEX1, you can specify only INDEX0 or INDEX1.

```
//ICEIN DD *
  AIC   DBD=INDEX0,DDN=SIDXDD30   <- If you specify INDEX0,
* AIC   DBD=INDEX1,DDN=SIDXDD30   <- you cannot specify INDEX1
*                                    because INDEX0 and INDEX1 are physically same database.
/*
```

- A compressed image copy data set cannot be used with IMS Database Recovery utility as an input data set. Use either the Recovery function of IMS HP Image Copy or the IMS Database Recovery Facility.

Restrictions for the Advanced Image Copy Services

- You cannot specify both OFFLDTYPE=F and OFFLDTYPE=S in a same job step.
- You cannot specify both OFFLDTYPE=F and ICOUT=(,%STACK) in a same job step.
- You cannot specify both ICOUT=(,*) and ICOUT=(,%STACK) in a same job step.
- If the input database is a multi-volume OSAM database, you must not use separate IEFBR14 utility step for each volume. If you use separate IEFBR14 step for each volume, extents that have the same identifier (volume 1) are created. Advanced Image Copy Services requires that you allocate your multi-volume data sets by using the standard DFSMS methods.
  If your input database data set is allocated by using separate IEFBR14 utility step for each volume, IMS HP Image Copy issues the following message and ends with a return code of 08.

```
FABJ0163E FORMAT OF INPUT DBDS IS NOT SUITABLE FOR DFSMSDSS ADVANCED
```

Restrictions for parallel processing

- Parallel image copy processing is invoked only by the FABJMAIN program.
- Both batch image copy and concurrent image copy cannot be specified in one job step.
- Parallel processing and sequential processing cannot coexist in one group.

Restrictions for single-step HASH Check (for full-function databases)

- For full-function databases, the Pointer to Segment Check function is not supported. Only the HASH Check option of the HD Pointer Checker is supported.
- All the restrictions that apply to stand-alone HD Pointer Checker HASH Check option jobs also apply to the HD Pointer Checker HASH Check processes that are invoked through the HASH Check option of the Image Copy function.
- The maximum number of databases that can be processed at a time is 2500.
- HASH Check cannot detect the following pointer-type errors:
  - Physical parent pointers that are not at the beginning or end of their twin chain
  - Direct address pointers in a HISAM database that chain the logical records from a primary to an overflow data set or the logical records in the overflow data set.
- For HALDBs, the HASH Check option has the following restrictions:
  - It can validate only physical pointers. It cannot validate logical relationships.
  - It does not provide the ability to analyze a PSINDEX database or a PHIDAM primary index database.
  - It cannot detect the following pointer-type errors:
    - Logical parent pointers and paired logical child pointers that reside in an Extended Pointer Set (EPS)
    - Indirect pointers that reside in the Indirect List Data Set (ILDS)
- In an image copy job, the maximum number of tasks for a HASH Check is 99.

Restrictions for multiple-step HASH Check (for full-function databases)

- In an IMS-managed ACBs environment, multiple-step HASH Check for full-function databases is not supported.
- For full-function databases, the Pointer to Segment Check function is not supported. Only the HASH Check option of the HD Pointer Checker is supported.
- All the restrictions that apply to stand-alone HD Pointer Checker HASH Check option jobs also apply to the HD Pointer Checker HASH Check processes that are invoked through the HASH Check option of the Image Copy function.
- Multiple-step HASH Check is not supported for parallel image copy processing.
- The maximum number of databases that can be processed at a time is 2500.
- The HASH Check option cannot detect the following pointer-type errors:
  - Physical parent pointers that are not at the beginning or end of their twin chain
  - Direct address pointers in a HISAM database that chain the logical records from a primary to an overflow data set or the logical records in the overflow data set.
- In HALDB, the HASH Check option has the following restrictions:
  - It can validate physical pointers only. It cannot validate logical relationships.
  - It does not provide the ability to analyze a PSINDEX database or a PHIDAM primary index database.
  - It cannot detect the following pointer-type errors:
    - Logical parent pointers and paired logical child pointers that reside in an Extended Pointer Set (EPS)
    - Indirect pointers that reside in the Indirect List Data Set (ILDS)

- Secondary index databases cannot be checked.

Restrictions for DEDB HASH Check

- The Pointer to Segment Check function is not supported. Only the HASH Check option of the DEDB Pointer Checker is supported.
- All restrictions that apply to stand-alone DEDB Pointer Checker HASH Check option jobs also apply to the DEDB Pointer Checker HASH Check option that is enabled in Image Copy function jobs.

Running the Image Copy function

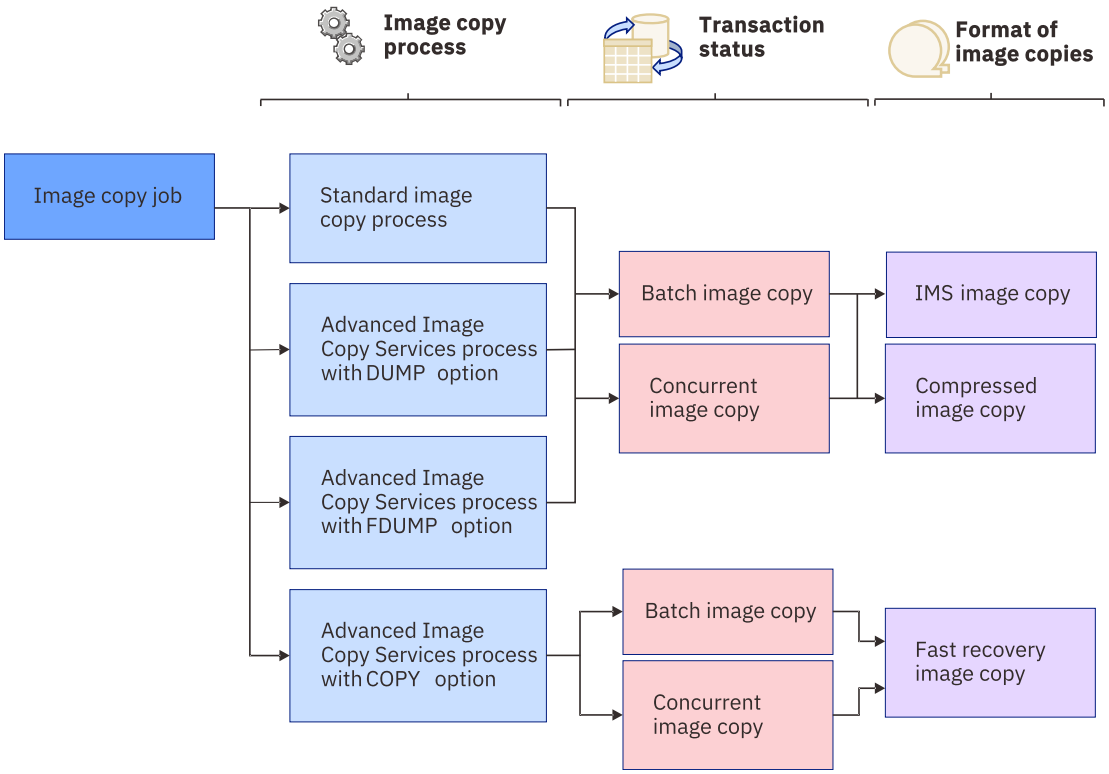
The following topics provide instructions for running the Image Copy function.

Preparing for taking image copies

IMS HP Image Copy supports several types of image copy processes, several methods for controlling transactions, and several formats for image copies. Before you run the Image Copy function to create image copies, determine these elements according to the requirements of your IMS environment.

About this task

The following figure shows the elements that you must consider for your image copy job.



In this task, you first determine the format of image copies, then the process type, and, finally, the application transaction status.

Format of image copies

Select the format of image copies that you want to create.

The Image Copy function creates image copies in one of the following formats. Image copies in any of these formats can be used for database recovery with the Recovery function of IMS HP Image Copy and IMS Database Recovery Facility.

Table 31: Format of image copies		
Format	**Output device**	**Description**
IMS image copy	DASD or tape	This format is the same as the format of image copies that are created by the Database Image Copy utility (DFSUDMP0). Image copies in this format can be used for database recovery with the Database Recovery utility (DFSURDB0). Image copies in this format can be created with the standard image copy process or the Advanced Image Copy Services process with the DUMP or FDUMP option.
Compressed image copy	DASD or tape	Image copies in this format can be created only by IMS HP Image Copy. Image copies in this format are compressed with one of the compression routines of IMS HP Image Copy. The advantage of this format is that you can reduce allocation space for output image copies. To create image copies in this format, specify the COMP keyword. Image copies in this format can be created with the standard image copy process or the Advanced Image Copy Services process with the DUMP or FDUMP option.
Fast Recovery image copy	DASD	Image copies in this format are the clones of the input database data sets. If the input database data set is a VSAM data set, the image copy data sets that are created are also VSAM data sets. Image copies in this format can be created with the Advanced Image Copy Services process with the COPY option.

Process type

IMS HP Image Copy supports two types of image copy processes: the standard image copy process and the Advanced Image Copy Services process.

Choose a process type based on these factors: the duration that IMS HP Image Copy accesses the database, the amount of system resources, and performance.

Standard image copy process

With this process, to reduce the CPU workload and EXCP (execute channel program) counts, the Image Copy function can optionally use the High Performance Input/Output (HPIO) interface to access database data sets. Also, the internal storage and buffers that are used in the image copy job can be automatically optimized to achieve improved performance over the Database Image Copy utility (DFSUDMP0).

Advanced Image Copy Services process

The Advanced Image Copy Services process uses DFSMSdss or a utility with equivalent functions to reduce the time that IMS HP Image Copy accesses the database and minimizes unavailability of the database.

Three options are supported for the Advanced Image Copy Services process: COPY, FDUMP, and DUMP. The COPY and FDUMP options minimizes the time IMS HP Image Copy accesses the databases.

In COPY and FDUMP processes, the HASH check option, if requested, is done for the image copy data sets or the temporary data sets after the input database data sets are released.

Table 32: Advanced Image Copy Services options	
Option	**Description**
COPY	This option is the only method for creating image copies in Fast Recovery image copy format. Image copies in standard image copy format cannot be created. This option uses the FlashCopy® function or the SnapShot function of DFSMSdss to create clones of input database data sets. The clones become the output image copy data sets. This option requires more resources than other Advanced Image Copy Services options or the standard image copy process to maintain the image copy data sets. If you specify the DATA_MOVER=EMCSNAP option, Advanced Image Copy Services uses EMC TimeFinder instead of DFSMSdss to create a snapshot copy of the database.
FDUMP	Uses the FlashCopy® function or the SnapShot function of DFSMSdss to create clones of input database data sets. After the input database data sets are released, the image copies are created in IMS image copy format or compressed image copy format from the clones. The output image copy data sets can be stored on a tape. This option requires the same amount of resources that are required by the COPY option while it creates the clones. However, because the clones are deleted at the end of the process, the resources required for maintaining the image copy data sets will be less than the resources required by the COPY option. If you specify the DATA_MOVER=EMCSNAP option, Advanced Image Copy Services uses EMC TimeFinder instead of DFSMSdss to create a snapshot copy of the database.
DUMP	This option is the only method for creating image copies of VSAM KSDS, that can be used for database recovery, with the concurrent image copy process. This option uses the DUMP function of DFSMSdss. When logical copies of the input data sets are created, the input database data sets are released. The output image copy data sets are committed when physical copies are created. However, if you request the stack option to create image copies on a stacked tape, a logical copy of the database data set does not start until a physical copy of the previous output data set is committed. The DUMP option converts the format of image copies from DFSMSdss format to IMS image copy format or compressed image copy format. Therefore, this option uses more CPU resources than the other two options of Advanced Image Copy Services. The performance is also slower than other two options. The DUMP option is not supported for the following types of database data sets: • Encrypted database data sets • Extended format data sets

Method for controlling application transaction status

Select the method for controlling application transactions that access the database while IMS HP Image Copy creates image copies.

If you can allow application transactions to stop, you can create clean image copies by using the batch image copy process. If you do not want to stop application transactions, you can create fuzzy image copies by using the concurrent image copy process.

Batch image copy process

The batch image copy process creates clean image copies that contain committed database records.

You can also use the batch image copy process when you want to measure the health of databases. Because all database records in the database are committed, you can run the HASH Check function or collect sensor data from the image copies.

The batch image copy process requires that all application transactions be stopped while the image copies are created. Spending additional efforts to manually stop and restart application transactions or the database each

time you create image copies might not be an ideal approach. IMS HP Image Copy supports the following two options to avoid such additional efforts.

Quiesce the database by using IMS Tools Online System Interface

You can request to quiesce the database using IMS Tools Online System Interface, which issues the UPDATE DB QUIESCE command to quiesce the database. When the database is quiesced, no updates to the database will be in progress, all prior updates are committed and written to DASD, and application programs with new updates for the database are held in a wait state until the database is released from its quiesce state. Therefore, you can create clean image copies. After the image copies are created, the interface issues the UPDATE DB QUIESCE command again to release the quiesce state.
To reduce the time that application programs are held in a wait state, consider using this method together with the COPY or FDUMP option of Advanced Image Copy Services.

You can request to quiesce the database and release the quiesce state of the database by specifying the TOIAUTO_Q keyword.

Stop the database by using IMS Tools Online System Interface

If you request to stop the database through IMS Tools Online System Interface, the interface issues the /DBD or /DBR command to stop the database. Therefore, you can create clean image copies. After the image copies are created, the interface issues the /START command to restart the database.
This method can also be used to start an offline database after the database is initialized or reorganized. The Image Copy function creates image copies of the offline database and registers the image copies to the RECON data sets, then the interface issues the /START command to bring the database online. This method allows you to start using the database immediately after the database is initialized or reorganized.

You can request to stop and restart the database by specifying the TOIAUTO keyword.

Concurrent image copy (CIC) process

With this method, you can create image copies without stopping application transactions. Because the database records in the created image copy data sets are not committed, you must use a log data set or change accumulation data set during database recovery.

> **Consideration:** If you run the HASH Check function for the image copies, pointer errors might be reported because database records are not committed.

The following requirements must be met to apply the concurrent image copy process:

- Database, database data sets, and area data sets are registered to DBRC.
- DBRC is used in the job (DBRC=Y).

The following restrictions apply if the database uses KSDS:

- COPY and FDUMP options of Advanced Image Copy Services cannot be used.
- Image copies, except for those created with the DUMP option of Advanced Image Copy Services, cannot be used for database recovery.
- If you specify CIC_KSDS=N, the Image Copy function does not create image copies of KSDS.

You can request the concurrent image copy process by using the CIC or ACIC statement.

Taking image copies

You can take image copies by invoking the FABJMAIN program.

Procedure

1. In FABJMAIN JCL, code the EXEC statement as follows:

```
//      EXEC PGM=FABJMAIN,REGION=nM,IMSPLEX=plex-name,DBRCGRP=dbrcgrp
```

Where:
IMSPLEX

If you need to start IMSplex through the IMS HP Image Copy job, specify the IMSPLEX parameter.

DBRCGRP

If you use the DBRCGRP keyword of IMS, you must specify the DBRCGRP parameter.

2. Code the appropriate DD statements. See "DD statements for creating image copies" on page 83. JCL examples are provided in "Examples for the Image Copy function" on page 106.
3. Code the corresponding control statement keywords in the ICEIN data set.
   To invoke the Image Copy function, you must specify the IC, AIC, CIC, or ACIC statement, or the GROUP statement with the FUNC keyword. For more information, see "ICEIN control statements" on page 154. For a list of control statement keywords, see "Control statement keywords for the Image Copy function" on page 90.
4. Submit the JCL.

Example

The following figure shows a sample JCL stream.

```
//* -----------------------------------------------------
//DEF#DMP EXEC PGM=IEFBR14
//RDUMPDS DD DSN=TEMPDS.RCNDUMP,
//           DISP=(,CATLG),
//           DCB=(DSORG=PS,RECFM=VB,LRECL=2048,BLKSIZE=20480),
//           SPACE=(CYL,(1,1)),UNIT=SYSDA
//* -----------------------------------------------------
//ICOPY   EXEC PGM=FABJMAIN,REGION=nM,COND(4,LT)
//STEPLIB   DD DISP=SHR,DSN=&HPSLIB
//          DD DISP=SHR,DSN=&IMSRES
//DFSRESLIB DD DISP=SHR,DSN=&IMSRES
//IMS       DD DISP=SHR,DSN=xxx
//IMSDALIB  DD DISP=SHR,DSN=xxxx
//RECON1    DD DISP=SHR,DSN=xxxxx
//RECON2    DD DISP=SHR,DSN=xxxxxx
//RECON3    DD DISP=SHR,DSN=xxxxxxx
//SYSPRINT  DD SYSOUT=*
//ICEPRINT  DD SYSOUT=*
//DFSPRINT  DD SYSOUT=*
//ICDD      DD DISP=OLD,DSN=TEMPDS.RCNDUMP
//ICEIN     DD *
            :
```

Enabling full-function single-step HASH Check option

To start single-step HASH Check while the Image Copy function creates image copies, you need to prepare a cataloged procedure, and specify additional DD statements and ICEIN control statement keywords in FABJMAIN JCL.

Procedure

1. Prepare a cataloged procedure for single-step HASH Check.
   Use the IBM® supplied cataloged procedure that is shown in the following figure or prepare a similar procedure of your own.
   Figure 14: FABPICHE cataloged procedure

```
//FABPICHE PROC HPSLIB='HPS.SHPSLMD0',          HPS LOAD LIBRARY
//             RESLIB='IMSVS.SDFSRESL',         IMS RESLIB
//             DBDLIB='IMSVS.DBDLIB',           IMS DBD LIBRARY
//             HPSSRC='HPS.SHPSSAMP(FABPVSAM)', HPS SAMPLE JCL LIBRARY
//             PRTBLK=6118   (133*46)       BLKSIZE OF PRINT DATA SETS
//*-------------------------------------------------------------------*
//HDPCPRO EXEC PGM=FABJMAIN
//STEPLIB   DD DISP=SHR,DSN=&HPSLIB
//          DD DISP=SHR,DSN=&RESLIB
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//DFSRESLB  DD DISP=SHR,DSN=&RESLIB
//IMS       DD DISP=SHR,DSN=&DBDLIB
//DFSPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
```

```
//*-------------------------------------------------------------------*
//* REPORTS
//*-------------------------------------------------------------------*
//ICEPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//PRIMAPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//STATIPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//VALIDPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//EVALUPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SNAPPIT   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SUMMARY   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSUDUMP  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
```

2. Prepare FABJMAIN JCL by following the steps described in "Taking image copies" on page 78.
   To enable the Single-step HASH Check option, specify HDPC=Y and additional DD statements that are required for the single-step HASH Check option. For a list of additional DD statements for HASH Check, see "DD statements for the full-function database HASH Check option" on page 87.

   > **Note:** Do not specify the DBDEFCTL DD statement in FABJMAIN JCL. If specified, it is regarded as multiple-step HASH Check.

   JCL examples are provided in "Examples for enabling the HD Pointer Checker HASH Check option" on page 112.
3. Submit the JCL.

Enabling full-function multiple-step HASH Check option

To run multiple-step HASH Check, you need to run the DBD Analysis program, the Image Copy job, and the HASH Evaluation program.

Procedure

1. Generate a DBDEFCTL data set.
   To make the HD Pointer Checker HASH Check option available for image copy, you must prepare a DBDEFCTL data set before the image copy execution. To do this, run the HD Pointer Checker DBD Analysis program on all databases whose pointers you want to validate with HASH Check.

   To run the DBD Analysis program, use the IBM® supplied cataloged procedure that is shown in the following figure, or prepare a similar procedure of your own.

   Examples in "Examples for enabling the HD Pointer Checker HASH Check option" on page 112 assume that the IBM® supplied cataloged procedure is used.
   Figure 15: FABPDA cataloged procedure

```
//FABPDA  PROC PSB=,                          PSBNAME
//        DBRC=N,                             DBRC=Y IF HALDB PROCESS
//        PRTBLK=6118,  (133*46)              BLKSIZE OF PRINT DATA SETS
//        DBDLIB='IMSVS.DBDLIB',              IMS DBD LIBRARY
//        PSBLIB='IMSVS.PSBLIB',              IMS PSB LIBRARY
//        RESLIB='IMSVS.SDFSRESL',            IMS RESLIB
//        DBTLIB='HPS.SHPSLMD0',              HPS LOAD LIBRARY
//        DBTSRC='HPS.SHPSSAMP(FABPVSAM)',    HPS SAMPLE JCL LIBRARY
//        DBDEFC='HPS.DBDEFCTL'               OUTPUT DBDEFCTL DSNAME
//*-------------------------------------------------------------------*
//HDPCPRO EXEC PGM=DFSRRC00,
//            PARM='DLI,FABPANAL,&PSB,,,,,,,,,,&DBRC,N'
//STEPLIB   DD DSN=&DBTLIB,DISP=SHR
//          DD DSN=&RESLIB,DISP=SHR
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//IMS       DD DSN=&PSBLIB,DISP=SHR
//          DD DSN=&DBDLIB,DISP=SHR
//DFSRESLB  DD DSN=&RESLIB,DISP=SHR
//DFSVSAMP  DD DSN=&DBTSRC,DISP=SHR
//IEFRDER   DD DUMMY
//SYSPRINT  DD SYSOUT=A
//*-------------------------------------------------------------------*
```

```
//* REPORTS
//*-------------------------------------------------------------------*
//PRIMAPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SNAPPIT   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSUDUMP  DD SYSOUT=A
//*-------------------------------------------------------------------*
//* FOR DBD ANALYSIS OUTPUT
//*-------------------------------------------------------------------*
//DBDEFCTL  DD DSN=&DBDEFC,DISP=OLD
//*-------------------------------------------------------------------*
```

Note: The DBDEFCTL data set that is created with an earlier release of IMS HP Pointer Checker can also be used.

The jobs create HASH records that are to be received as input by the HASH Evaluation program job.
To prepare a procedure of your own, do as follows:

a. Prepare the JCL for the DBD Analysis program job.
In the DBD Analysis program JCL, code the EXEC statement as follows:

```
//      EXEC PGM=DFSRRC00,PARM='DLI,FABPANAL,psbname,,,,,,,,,,dbrc,N'
```

The format of the PARM parameter is the same as the format used in the DLIBATCH procedure. Only the parameters shown need be coded. The variable *psbname* must be defined as a PSB with LANG=ASSEM or LANG=COBOL. It must (either directly or indirectly) refer to all input databases to be scanned by the Image Copy function with the HASH Check option. The number of databases that are referred to in a PSB must be less than 2500.

Because the DBD Analysis program is run as a DL/I batch program, you must not use a PSB that contains a PCB statement with a DEDB or an MSDB. If you do, the job abends with a 1001 code.

For HALDBs, the DBRC parameter is needed and must be Y.

b. Code the appropriate DD statements and control statements.
The DD statements that can be used for the DBD Analysis program are provided in "DBD Analysis program reference" on page 102.

The DBD Analysis program job must be run with the utility control statements that include the DATABASE statements for all database data sets that are to be evaluated. This job creates the DBDEFCTL data set that is required for both the Image Copy jobs of IMS HP Image Copy and the HASH evaluation job. The created DBDEFCTL data set can be used repeatedly for such jobs as:

- Adding or deleting a database for evaluation.
- Changing the PSB or DBD of a database.

c. Submit the JCL.

2. Prepare FABJMAIN JCL by following the steps that are described in "Taking image copies" on page 78 and run Image Copy jobs for all database data sets.
To enable the multiple-step HASH Check option, specify HDPC=Y and additional DD statements that are required for the multiple-step HASH Check option. The DD statements are described in "DD statements for the full-function database HASH Check option" on page 87.

For HALDBs, the DBRC parameter is needed and must be Y.

If HDPC=Y is specified in the ICEIN control statement and the DBDEFCTL DD is present, FABJMAIN runs while HD Pointer Checker HASH Check is running in multiple steps.

3. Run the HASH Evaluation program.
Run a HASH Evaluation program job with all the SORTEX data sets that were created by the Image Copy jobs of IMS HP Image Copy. The HASH Evaluation program job must be run with the concatenated input of all HASH records created by the Image Copy job of IMS HP Image Copy.

To run the HASH Evaluation program, use the IBM® supplied cataloged procedure that is shown in the following figure, or prepare a similar procedure of your own.

Examples in "Examples for enabling the HD Pointer Checker HASH Check option" on page 112 assume that the IBM® supplied cataloged procedure is used.
Figure 16: FABPHE cataloged procedure

```
//FABPHE  PROC PSB=,                          PSBNAME
//        DBRC=N,                             DBRC=Y IF HALDB PROCESS
//        U=SYSDA,
//        CYL='1,1',                          SPACE FOR  WORK DATA SETS
//        PRTBLK=6118,  (133*46)              BLKSIZE OF PRINT DATA SETS
//        DBDLIB='IMSVS.DBDLIB',              IMS DBD LIBRARY
//        PSBLIB='IMSVS.PSBLIB',              IMS PSB LIBRARY
//        RESLIB='IMSVS.SDFSRESL',            IMS RESLIB
//        DBTLIB='HPS.SHPSLMD0',              HPS LOAD LIBRARY
//        DBTSRC='HPS.SHPSSAMP(FABPVSAM)',    HPS SAMPLE JCL LIBRARY
//        DBDEFC='HPS.DBDEFCTL',              INPUT DBDEFCTL DATA SET
//        SORTEX='HPS.SORTEX'                 INPUT HASH RECORD DATA SET
//*-------------------------------------------------------------------*
//HDPCPRO EXEC PGM=DFSRRC00,
//             PARM='DLI,FABPHCTL,&PSB,,,,,,,,,,&DBRC,N'
//STEPLIB   DD DSN=&DBTLIB,DISP=SHR
//          DD DSN=&RESLIB,DISP=SHR
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//IMS       DD DSN=&PSBLIB,DISP=SHR
//          DD DSN=&DBDLIB,DISP=SHR
//DFSRESLB  DD DSN=&RESLIB,DISP=SHR
//DFSVSAMP  DD DSN=&DBTSRC,DISP=SHR
//IEFRDER   DD DUMMY
//SYSPRINT  DD SYSOUT=A
//*-------------------------------------------------------------------*
//* REPORTS
//*-------------------------------------------------------------------*
//SYSPRINT  DD SYSOUT=A
//PRIMAPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//EVALUPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SUMMARY   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSUDUMP  DD SYSOUT=A
//*-------------------------------------------------------------------*
//* HASH EVALUATION INPUT DATA SET
//*-------------------------------------------------------------------*
//DBDEFCTL  DD DSN=&DBDEFC,DISP=SHR
//SORTIN    DD DSN=&SORTEX,DISP=SHR
```

To prepare a procedure of your own, do as follows:

a. Prepare the JCL for the HASH Evaluation program job.
In the HASH Evaluation program JCL, code the EXEC statement as follows:

   If all databases are non-HALDB, this statement must be in the following format:

   ```
   //      EXEC PGM=FABPHCTL
   ```

   If any one of the databases is a HALDB, this statement must be in the following format:

   ```
   //      EXEC PGM=DFSRRC00,
   //           PARM='DLI,FABPHCTL,psbname,,,,,,,,,,Y,N'
   ```

b. Code the appropriate DD statements.
The DD statements that can be used for the HASH Evaluation program are provided in "HASH Evaluation program reference" on page 105.

c. Submit the JCL.

Enabling DEDB HASH Check option

To start DEDB HASH Check while the Image Copy function creates image copies, you must specify additional DD statements and ICEIN control statement keywords in FABJMAIN JCL.

Procedure

1. Prepare FABJMAIN JCL by following the steps described in "Taking image copies" on page 78.
To enable the DEDB HASH Check option, specify DEDBPC=Y, and additional DD statements that are required for the DEDB HASH Check option.

   For a list of additional DD statements, see "DD statements for the DEDB HASH Check option" on page 89.
Also see examples provided in "Examples for enabling the DEDB HASH Check option" on page 115.

2. Submit the JCL.
   The DEDB Pointer Checker is invoked for each area indicated in the utility control statements.

DD statements for the Image Copy function

Refer to the following reference topics to write DD statements for the Image Copy function that is run by the FABJMAIN program.

DD statements for creating image copies

DD statements are used to identify the source of input and the placement of output information. The following DD statements are supported for the Image Copy function run by the FABJMAIN program.

Table 33: DD statements for the Image Copy function

DDNAME	Use	Format	Required or optional
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMSDALIB	Input	PDS	Optional
RECON1 RECON2 RECON3	Input/Output	KSDS	Required if DBRC=Y (See Note 1)
IMS	Input	PDS	Required (See Note 2)
ICEIN	Input	LRECL=80	Required
ICEPRINT	Output	LRECL=133	Required
DFSPRINT	Output	LRECL=122	Required
ICERPRT	Output	LRECL=133	Optional
ICEDLIST	Output	LRECL=133	Optional
FABJSTAT	Output	LRECL=133	Optional
datain	Input	VSAM or OSAM	Required (See Note 3)
areain	Input	ESDS	Required (See Note 3)
dataout1	Output	RECFM=FB or VBS	Required (See Note 3)
dataout2	Output	RECFM=FB or VBS	Optional (See Note 3)
stack1	Output	RECFM=FB or VBS	Required (See Note 3)
stack2	Output	RECFM=FB or VBS	Optional (See Note 3)
DSSPRINT	Output	LRECL=133	Optional
DSSSTATS	Output	LRECL=133	Optional
CHKPTDD	Input/Output	LRECL=4096 or greater, RECFM=VB	Optional
HPSRETCD	Input	LRECL=80	Optional
FABJDRSN	Input	LRECL=80	Optional
FABJHRDD	Input/Output	RECFM=VB	Optional
FABJRDMP	Output	LRECL=(RECON CI size) +4, RECFM=VBA	Optional
SYSABEND or SYSUDUMP	Output	LRECL=133	Optional

DDNAME	Use	Format	Required or optional

Notes:

1. Do not specify these DD statements if you want the RECON data sets allocated dynamically.
2. IMS DD statement is not required when the IMS management of ACBs is enabled.
3. IMS HP Image Copy supports dynamic allocation for these data sets. If you want these data sets allocated dynamically, do not specify these DD statements.

STEPLIB DD

This statement points to two load module library data sets that must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

where:

HPS.SHPSLMD0

The name of the library that contains the load modules of IMS HP Image Copy.

IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

To use IMS HP Image Copy site default table, you must specify the library that contains the IMS HP Image Copy site default table.

To enable the following functions, you must concatenate the appropriate load module libraries to the STEPLIB DD:

- The IMS Tools Generic Exits library to run the job in the IMS-managed ACBs environment
- The IMS Tools KB library to store the reports in the central repository
- The IMS Tools Generic Exits and IMS Tools Online System Interface libraries to use the following features:
  - To use the IMS command interface through IMS Tools Online System Interface
  - To collect VSAM statistics from full-function databases with the DB Sensor function
  - To collect VSAM statistics from full-function databases by using the HASH Check option with Space Monitor
- The IMS Tools Generic Exits library to offload workload to zIIP processors
- The IMS HP Pointer Checker library to enable the HASH Check option or the logical relation search option (DBALL)
- All of the following libraries to use the DB Sensor function to collect sensor data from full-function databases:
  - Either IMS Database Solution Pack libraries or IMS Database Utility Solution libraries
  - IMS Database Reorganization Expert library
  - IMS Tools KB library
- The IMS Fast Path Solution Pack library to enable the DEDB HASH Check option
- The IMS Fast Path Solution Pack library and the IMS Tools KB library to use the DB Sensor function to collect sensor data from Fast Path databases

If IMS HP Pointer Checker is called with the HOMECHK, CHAINDIST, or COMPFACT option, you must specify the library that contains the randomizer or the segment edit/compression routine.

If STEPLIB is unauthorized because it specifies libraries concatenated to IMS.SDFSRESL, you must specify a DFSRESLB DD statement.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMSDALIB DD

This statement specifies the dynamic allocation members for the database, the index, and the RECON data sets. Allocation of these data sets is attempted in the following order:

1. DD statements found in the JCL stream
2. Dynamic allocation members in the IMSDALIB concatenation
3. Dynamic allocation members in the JOBLIB or STEPLIB concatenation

For dynamic allocation of HALDB databases, RECON data sets are used instead of this DD statement.

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

IMS DD

This statement defines the library that contains the DBD describing the database to dump, generally DSNAME=IMS.DBDLIB. The data set must reside on a direct-access volume.
This statement is not required when the IMS management ACBs is enabled.

ICEIN DD

This statement is required. It specifies the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input stream (DD * or DD DATA).
For details, see "ICEIN control statements" on page 154. For a list of control statement keywords, see "Control statement keywords for the Image Copy function" on page 90.

ICEPRINT DD

This statement is required. It specifies the output messages data set. The IMS HP Image Copy main module generates messages in this data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

DFSPRINT DD

This statement is required. It specifies the output message data set. The data set contains messages from the IMS HP Image Copy module that has alias name DFSUDMP0 or DFSURDB0. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).
If this DD statement is not specified, IMS HP Image Copy ends abnormally with U3905.

ICERPRT DD

This statement specifies the report data set. The Image Copy Dump Process report is generated in this data set. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

ICEDLIST DD

This statement specifies the output messages data set. The DBRC report for DBRC commands, such as the NOTIFY.IC, the NOTIFY.UIC, and the CHANGE.IC commands, is generated in this data set. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

FABJSTAT DD

This statement specifies the report data set. The Data Set Statistics report is generated in this data set. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

***datain* DD**

This statement defines the input data set to be dumped. The ddname (*datain*) of this statement must be the same as the one in the DBD that describes this data set.

You can request the Image Copy function to dynamically allocate the input data set using the DFSMDA member. To dynamically allocate the data set, omit this DD statement and specify the DBDALLOC=YES parameter in the ICEIN data set. IMS HP Image Copy determines the optimal buffer size for each data set.

***areain* DD**

You can specify up to seven *areain* DD statements to specify multiple DEDB area data sets. If the area is registered to the RECON data set, the ddname specified to each *areain* DD statement must not be the area name. If the area is not registered, the ddname specified to the *areain* DD statement must be the area name (ddname operand in the DBD area macro).
You can request the Image Copy function to dynamically allocate the input data set using the DFSMDA member or the ADS list information in the RECON data set. To dynamically allocate the data set, omit this DD statement and specify the DBDALLOC=YES parameter in the ICEIN data set. IMS HP Image Copy determines the optimal buffer size for each data set.

***dataout1* DD or *stack1* DD**

This statement defines the first copy of the dumped output data set.
One DD statement is required for each data set to be dumped unless the output data set is dynamically allocated. The ddname can be any 1- to 8-character string, but the ddname must appear in the associated utility control statement. The output device must be either a direct-access device or a tape.

Standard labels must be used. If the output is a direct-access device, BLKSIZE is determined by the system to optimize output DASD BLKSIZE. If BLKSIZE is specified in the JCL, that BLKSIZE is used.

You can request the Image Copy function to allocate the output data set dynamically by omitting this DD statement and specifying the ICDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

For details, see "ICOUT keyword" on page 207 and "STACK keyword" on page 241.

***dataout2* DD or *stack2* DD**

This statement is required only if the associated utility control statement requests two copies of the dump. The name must appear in the control statement. The name must be that of either the tape or the direct-access device. Standard labels must be used. If the output is a direct-access device, BLKSIZE is determined by the system to optimize output DASD BLKSIZE. If BLKSIZE is specified in the JCL, that BLKSIZE is used. If either of the two output copies has an "open" problem (message DFS301A) or fails the first PUT operation to either output data set (message DFS319A), the current control statement is terminated and the next control statement is processed.

Once the utility has proceeded beyond the first PUT, all I/O errors caused by output data set result in RC=08, but the utility continues to copy to the remaining output data set. Each image copy control statement is treated as an independent copy; the last return code is the highest received for the job.

To have the Image Copy function dynamically allocate the output data set, omit this DD statement and specify the ICDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

For details, see "ICOUT keyword" on page 207 and "STACK keyword" on page 241.

DSSPRINT DD

This statement specifies the output messages data set for the messages that DFSMSdss™ generates when the Advanced Image Copy Services is used. If this statement is present, DFSMSdss™ issues messages that are prefixed with ADR to the data set. These messages provide processing information and any errors that occurred during processing.

DSSSTATS DD

This statement specifies the optional output message data set for messages on statistics of DFSMSdss™ User Interaction module (UIM) processing when Advanced Image Copy Services is used. If this statement is present, IMS HP Image Copy creates the DFSMSDSS User Interaction Module (UIM) Statistics report, which includes information about UIM processing, such as the start and the end time, task ID, and target database name.

CHKPTDD DD

This statement is a function-unique DD statement for the Checkpoint Restart option. The DD statement is effective when RESTART=Y|N|C is specified. This statement defines the checkpoint file. It must be the same file used for both a particular checkpoint and for the associated attempted subsequent restarts. Additionally, the file must be preallocated and cataloged before the requested checkpoint or restart. If the checkpoint file (CHKPTDD) is not defined in the job step or is DD DUMMY, then the Checkpoint Restart processing is bypassed. However, the requested functions are attempted.

For details, see "RESTART keyword" on page 227.

HPSRETCD DD

This statement is a function-unique DD statement for the Return Code Handling option. This optional input data set contains the user-specified control statements that define the return codes of the IMS HP Image Copy process.

For details, see "HPSRETCD control statement" on page 270.

FABJDRSN DD

This statement specifies the input data set that contains the user-specified control statements for defining the error reason code (S99ERROR) and the SMS reason code (S99ERSN) for dynamic allocation.

For details, see "FABJDRSN control statement" on page 272.

FABJHRDD DD

This statement is a function-unique DD statement for Checkpoint Restart. It is used with the HASH option of the RESTART keyword. This DD statement is effective when RESTART=(Y,HASH) and HDPC=Y are specified. The file must be preallocated and cataloged before running the requested checkpoint or restart. If the HASH record file (FABJHRDD) is not defined in the job step or is DD DUMMY, the HASH record validation that uses FABJHRDD is bypassed.
This DD defines the validation of the HASH record file, which is used at restart time. It must be the same file that is used for both a particular checkpoint and for the associated attempted subsequent restarts. If HASH Check finds, at the restart time, the same hash error as in the previous run, IMS HP Image Copy regards it as the database having fatal error, and does not restart the next run.

FABJRDMP DD

This statement specifies the output data set for storing the RECON REPRO output (in QSAM format) for diagnosis use. IMS HP Image Copy runs REPRO and stores the RECON data set into the data set that this DD points to, if the DD is defined and the following conditions are met:

- DBDS record is found in RECON, but its corresponding database record is not found by the Image Copy function or the Recovery function.
- IC record is found in RECON, but its corresponding DBDS record is not found by the Recovery function.

Tape drives are not supported.

This DD is optional.

The specification is as follows:

```
//FABJRDMP DD  DISP=OLD,DSN=dataset_name
```

where *dataset_name* is the data set name where REPRO output is stored.

SYSABEND DD

SYSUDUMP DD

These statements define a dump data set. If both statements are present, the last occurrence is used for the dump.

DD statements for the full-function database HASH Check option

To enable the HD Pointer Checker HASH Check option, you must specify in FABJMAIN JCL, the appropriate DD statements for the HD Pointer Checker HASH Check option.

The following table summarizes the DD statements for HD Pointer Checker.

Table 34: DD statements for HD Pointer Checker (HDPC=Y is specified)

DDNAME	Use	Format	Required or optional
DBDEFCTL	Output	LRECL=133	Required if run in multiple steps (See Note 1)
IMS2	Input	PDS	Required if you use FABPZWTO
FSESTAT	Input/Output	LRECL=134	Required if run in multiple steps (See Note 2)
HISTORY	Input/Output	KSDS	Required if run with the HISTORY option
PRIMAPRT	Output	LRECL=133	Required
STATIPRT	Output	LRECL=133	Required (See Note 2)

DDNAME	Use	Format	Required or optional
VALIDPRT	Output	LRECL=133	Required (See Note 2)
EVALUPRT	Output	LRECL=133	Required if run in single step
SUMMARY	Output	LRECL=133	Required if run in single step
SNAPPIT	Output	LRECL=133	Required (See Note 2)
SORTEX	Output	LRECL=40	Required if run in multiple steps (See Note 3)
SPMNIN	Input	LRECL=80	Optional
SPMNSPDT	Input/Output	Fixed record length	Optional

Notes:

1. If you want to invoke HD Pointer Checker HASH Check in single step, do not specify this statement or specify DUMMY.
2. Besides the data sets in this table, the following data sets are allocated dynamically as temporary data sets. You do not need to specify them in the JCL, but you must not use these names in your JCL statements because they are used by HD Pointer Checker.
   - STATIP*nn* DD (*nn*=01, 02, 03, ...99)
   - VALIDP*nn* DD (*nn*=01, 02, 03, ...99)
   - SNAPPI*nn* DD (*nn*=01, 02, 03, ...99)
   - FSESTA*nn* DD (*nn*=01, 02, 03, ...99)
3. If you want to invoke HD Pointer Checker HASH Check in single step, do not specify the SORTEX DD statement nor specify DUMMY for the DD statement.

The following DD statements are applicable when HDPC=Y is specified.

DBDEFCTL DD

If HDPC=Y is specified in the ICEIN statement, either the single step or multiple steps HD Pointer Checker HASH Check is invoked. If this DD statement is specified, it means that multiple step is chosen, and so DBD Analysis and HASH evaluation steps become necessary. If you want to invoke HD Pointer Checker HASH Check in single step, delete this statement or specify DUMMY.
This statement defines the input partitioned data set created by the HD Pointer Checker DBD Analysis program. This data set contains:

- Database definitions for each database as a PDS member named with each DBD name
- The process control information for the HD Pointer Checker HASH Check option

To specify the member name of the process control information, use the DATASET (or DSN) keyword as follows:

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL(member)
```

If the member named is omitted, as in the following example, the default member name PROCTL01 is used for the control information.

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL
```

This data set lists all of the databases that take part in the logical relationship and must be evaluated at the same time. For details about preparing this data set, see "DBD Analysis program reference" on page 102.

IMS2 DD

This statement defines the library that contains the FABPZWTO user exit, the partition selection exit module, or both. The data set must reside on a direct-access volume. It is required if you want to use FABPZWTO, the partition selection exit, or both.

FSESTAT DD

This statement defines the work data set used by the HDAM, HIDAM, HDAM, and PHIDAM scan processes. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option in multiple steps. If BLKSIZE is coded on the DD statement, it must be a multiple of 134.

HISTORY DD

This optional data set defines the HISTORY data set (VSAM KSDS) that is used as input to the DB Historical Data Analyzer and Space Monitor of IMS HP Pointer Checker. When the HISTORY option is specified, this data set is required, and must be allocated and initialized by the DB Historical Data Analyzer utility before you run IMS HP Image Copy. DISP=SHR must be used. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

PRIMAPRT DD

This statement defines the output data set that contains primary reports generated by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM HASH Check option processes. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

STATIPRT DD

This statement defines the output data set that contains the statistics reports generated for HISAM, HDAM, HIDAM, PHDAM, and PHIDAM. This statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

VALIDPRT DD

This statement defines the output data set that contains the legend and the validation reports produced by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM HASH Check option processes. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

EVALUPRT DD

This statement defines the output data set containing the evaluation reports. It is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option in single step. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

SUMMARY DD

This statement defines the output data set containing the summary reports. It is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SNAPPIT DD

This statement defines the output data set that contains the block maps and block dumps that the HDAM, HIDAM, HDAM, and PHIDAM scan processes produce. The block maps and block dumps are produced when the HDAM HIDAM, HDAM, and PHIDAM scan process detects pointer errors, incorrect FSEAPs or FSEs, or T2 errors. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

SORTEX DD

This statement defines the output data set that contains 40 byte sort records written by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM processes. It contains pointer type records for both each segment type and each segment type records. This data set is used as the input data set for the subsequent EVALUATE process. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option in multiple steps. LRECL must be 40, and BLKSIZE must be a multiple of 40. If you want to invoke the HD Pointer Checker HASH Check option in single step, delete this statement. Do not specify "DUMMY" for the SORTEX DD.

SPMNIN DD

This optional input data set contains the control statements for Space Monitor of IMS HP Pointer Checker. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

SPMNSPDT DD

This optional input/output sequential data set is the graph record data set for Space Monitor. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

DD statements for the DEDB HASH Check option

To enable the DEDB Pointer Checker HASH Check option, you must specify in FABJMAIN JCL, the appropriate DD statements for the DEDB Pointer Checker HASH Check option.

The following table summarizes the DD statements for DEDB Pointer Checker.

Table 35: DD statements for DEDB Pointer Checker (DEDBPC=Y or DEDBPC=S is specified)			
DDNAME	**Use**	**Format**	**Required or optional**
HISTORY	Output	LRECL=100	Required if run with the HISTORY option
MSGOUT	Output	LRECL=133	Required
REPORT	Output	LRECL=133	Required
SNAPDPIT	Output	LRECL=133	Required
SORTIN	Work	LRECL=12	Optional if DEDBPC=S is specified
SORTOUT	Work	LRECL=12	Optional if DEDBPC=S is specified
SORTWK*nn*	Work		Required
SYSOUT	Output		Required

The following DD statements are applicable when DEDBPC=Y or S is specified.

HISTORY DD

This statement defines the output data set that contains historical records. A historical record is generated for each area if the HISTORY parameter is specified for the DEDBPC keyword.
For more information, see the *IMS Fast Path Solution Pack IMS Supplementary Utilities User's Guide*.

MSGOUT DD

This statement defines the output data set for DEDB Pointer Checker messages.

REPORTS DD

This statement defines the output data set for the Pointer Chain Reconstruction report of the DEDB Pointer Checker. The data set can reside on a direct-access device or printer, or be routed through the output stream.

SNAPDPIT DD

This statement defines the output data set for the DEDB CI map or CI dump report. The data set can reside on a direct-access device or can be routed through the input stream.

SORTIN or SORTOUT DD

These DD statements define the work data sets used for the subset pointer check function of the DEDB Pointer Checker. If you want to use the data space for the subset pointer check, or if you do not want to use the subset pointer check function at all, you can omit these DD statements.

SORTWK*nn* DD

These DD statements define the intermediate storage data sets used by DFSORT™. For more information about SORTWK*nn* DD statements, see *DFS™ Application Programming Guide*. Allocating a space twice the size used by the SORTIN data set is usually adequate for each work data set.

SYSOUT DD

This statement defines the output data set for DFSORT™ messages.

Control statement keywords for the Image Copy function

The following tables summarize the keywords that are supported for the Image Copy function.

Subsections:

- “Keywords for process control” on page 91
- “Keywords for specifying input data sets” on page 91
- “Keywords for dynamically allocating output image copy data sets” on page 92
- “Keywords for naming output image copy data sets” on page 93
- “Keywords for defining attributes of image copy data sets” on page 94
- “Keywords for data set stacking” on page 95
- “Keywords for Advanced Image Copy Services” on page 95
- “Keywords for DBRC processing” on page 96

- “Keywords for Checkpoint Restart” on page 96
- “Keywords for creating compressed image copies” on page 97
- “Keywords for controlling application transaction status” on page 97
- “Keywords for group processing” on page 98
- “Keywords for processing index databases” on page 98
- “Keywords for HASH Check” on page 98
- “Keywords for DB Sensor” on page 99
- “Keywords for storing reports in the IMS Tools KB repository” on page 100
- “Keywords for buffer tuning” on page 100
- “Keywords for controlling shadow data sets” on page 100
- “Keywords for error handling” on page 101

Keywords for process control

The following table summarizes the keywords for process control.

Table 36: Keywords for process control

Keyword	Statement	Description	Topic
DYNA_RETRY	GLOBAL	The DYNA_RETRY keyword specifies whether IMS HP Image Copy retries to allocate database data sets dynamically when dynamic allocation fails due to database data sets already being allocated by another application with DISP=OLD.	“DYNA_RETRY keyword” on page 185
EMPOSAM	GLOBAL	The EMPOSAM keyword specifies whether IMS HP Image Copy creates image copy data sets of the OSAM database that is not formatted.	“EMPOSAM keyword” on page 186
FALLBACK	GLOBAL	The FALLBACK keyword internally switches the batch image copy process to the concurrent image copy process when exclusive authorization of the input database is not granted during the batch image copy process.	“FALLBACK keyword” on page 189
FASTIC	GLOBAL	The FASTIC keyword enables Advanced Image Copy Services (using the DFSMSdss™ API) for creating image copies.	“FASTIC keyword” on page 190
GSGNAME	GLOBAL	The GSGNAME keyword specifies the global service group (GSG) name for Remote Site Recovery (RSR).	“GSGNAME keyword” on page 195
HPIO	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The HPIO keyword specifies whether to use the HP Input/Output interface.	“HPIO keyword” on page 199
MSGFREQ	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The MSGFREQ keyword specifies how often IMS HP Image Copy issues progress messages during image copy operation.	“MSGFREQ keyword” on page 219
RECALL	GLOBAL	The RECALL keyword recalls input database data sets if the data sets are migrated by DFSMShsm.	“RECALL keyword” on page 225
TASKCTL	GLOBAL	The TASKCTL keyword specifies the maximum number of IC tasks that can run in parallel.	“TASKCTL keyword” on page 246

Keywords for specifying input data sets

The following table summarizes the keywords for specifying input data sets.

Table 37: Keywords for specifying input data sets			
Keyword	**Statement**	**Description**	**Topic**
AREA	IC, AIC, CIC, ACIC	The AREA keyword specifies the names of areas in the database to be processed. The AREA keyword is applicable only to DEDBs.	"AREA keyword" on page 163
CAGRP	GROUP	The CAGRP keyword specifies the name of the change accumulation group (CA group) that is registered to the DBRC RECON data set.	"CAGRP keyword" on page 165
DBALL	GLOBAL	The DBALL keyword specifies to search logical group DBDSs automatically.	"DBALL keyword" on page 173
DBD	IC, AIC, CIC, ACIC	The DBD keyword specifies the name of the DBD to be processed.	"DBD keyword" on page 175
DBDALLOC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The DBDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates data sets of DL/I database, HALDB, or DEDB areas.	"DBDALLOC keyword" on page 176
DBDSGRP	GROUP	The DBDSGRP keyword specifies the name of the database data set group (DBDS) that is registered to the DBRC RECON data set.	"DBDSGRP keyword" on page 177
DDN	IC, AIC, CIC, ACIC	The DDN keyword specifies the database data set (DBDS) DD name. This keyword is applicable only to full-function databases.	"DDN keyword" on page 178
PART	IC, AIC, CIC, ACIC	The PART keyword specifies the name of the partition to process.	"PART keyword" on page 224

Keywords for dynamically allocating output image copy data sets

The following table summarizes the keywords for dynamically allocating output image copy data sets.

Table 38: Keywords for dynamically allocating output image copy data sets			
Keyword	**Statement**	**Description**	**Topic**
DATACLAS	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The DATACLAS keyword specifies the name of the data class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.	"DATACLAS keyword" on page 171
DATACLAS2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The DATACLAS2 keyword specifies the name of the data class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.	"DATACLAS2 keyword" on page 171
DATACLAS*n*	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The DATACLAS*n* keyword specifies the name of the data class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.	"DATACLASn keyword" on page 172
DRSNDSN	GLOBAL	The DRSNDSN keyword specifies the name of the data set that contains FABJDRSN control statements, which define the error reason codes and SMS reason codes of dynamic allocation.	"DRSNDSN keyword" on page 181
GDGBASE	GLOBAL	The GDGBASE keyword specifies whether IMS HP Image Copy creates a catalog entry for the generation data group.	"GDGBASE keyword" on page 193
GDGLIMIT	GLOBAL	The GDGLIMIT keyword specifies the maximum number of generation data sets that can be associated with the GDG that is being defined.	"GDGLIMIT keyword" on page 193

Keyword	Statement	Description	Topic
ICDALLOC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates output image copy data set if relevant DD statements are not supplied in the JCL.	"ICDALLOC keyword" on page 201
MGMTCLAS	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The MGMTCLAS keyword specifies the name of the management class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.	"MGMTCLAS keyword" on page 217
MGMTCLAS2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The MGMTCLAS2 keyword specifies the name of the management class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.	"MGMTCLAS2 keyword" on page 217
MGMTCLAS*n*	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The MGMTCLAS*n* keyword specifies the name of the management class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.	"MGMTCLASn keyword" on page 218
SPACE	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The SPACE keyword specifies the space parameter for the output image copy data set for dynamic allocation.	"SPACE keyword" on page 239
STORCLAS	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The STORCLAS keyword specifies the name of the storage class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.	"STORCLAS keyword" on page 244
STORCLAS2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The STORCLAS2 keyword specifies the name of the storage class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.	"STORCLAS2 keyword" on page 244
STORCLAS*n*	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The STORCLAS*n* keyword specifies the name of the storage class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.	"STORCLASn keyword" on page 245
UNIT	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The UNIT keyword specifies the UNIT parameter for the allocation of the output image copy data set.	"UNIT keyword" on page 261
UNIT2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The UNIT2 keyword specifies the UNIT parameter for allocation of the secondary output image copy data set.	"UNIT2 keyword" on page 261
VIC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VIC keyword specifies whether to process virtual image copies for primary and secondary index databases.	"VIC keyword" on page 263

Keywords for naming output image copy data sets

The following table summarizes the keywords for naming output image copy data sets.

Table 39: Keywords for naming output image copy data sets

Keyword	Statement	Description	Topic
DSN	GLOBAL	The DSN keyword specifies the data set naming template for the primary image copy data set that IMS HP Image Copy dynamically allocates.	"DSN keyword" on page 183
DSN2	GLOBAL	The DSN2 keyword specifies the data set naming template for the secondary image copy data set that IMS HP Image Copy dynamically allocates.	"DSN2 keyword" on page 183
DSN*n*	GLOBAL	The DSN*n* keyword specifies the data set naming template for the third to seventh image copy data sets that IMS HP Image Copy dynamically allocates.	"DSNn keyword" on page 184

Keyword	Statement	Description	Topic
ICHLQ	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICHLQ keyword specifies the data set name prefix for the image copy data set.	"ICHLQ keyword" on page 202
ICHLQ2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICHLQ2 keyword specifies the data set name prefix for the secondary image copy data set.	"ICHLQ2 keyword" on page 204
ICHLQ*n*	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICHLQ*n* keyword specifies the data set name prefix for the *n*th image copy data set.	"ICHLQn keyword" on page 205
ICNMRULE	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICNMRULE keyword selects the naming convention for the output image copy data set when used together with ICOUT=*|(*,*).	"ICNMRULE keyword" on page 206

Keywords for defining attributes of image copy data sets

The following table summarizes the keywords for specifying the attributes for image copy data sets.

Table 40: Keywords for attributes for image copy data sets

Keyword	Statement	Description	Topic
DSNTYPE	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The DSNTYPE keyword specifies whether IMS HP Image Copy allocates large format data sets or basic format data sets for output image copy data sets.	"DSNTYPE keyword" on page 184
EXPDT	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The EXPDT keyword specifies the expiration date for the output image copy data set.	"EXPDT keyword" on page 187
EXPDT2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The EXPDT2 keyword specifies the expiration date for the secondary output image copy data set.	"EXPDT2 keyword" on page 187
EXPDT*n*	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The EXPDT*n* keyword specifies the expiration dates for the third to seventh output image copy data sets.	"EXPDTn keyword" on page 188
ICCAT	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICCAT keyword specifies whether IMS HP Image Copy catalogs output image copy data sets.	"ICCAT keyword" on page 200
ICOUT	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICOUT keyword specifies the DD name of the output image copy data set.	"ICOUT keyword" on page 207
KEYLABEL	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The KEYLABEL keyword specifies the key label used for data set encryption.	"KEYLABEL keyword" on page 214
LBI	GLOBAL	The LBI keyword specifies whether to use the large block interface (LBI), which allows block sizes that are greater than 32 KB, when IMS HP Image Copy dynamically allocates output image copy data sets on a tape device.	"LBI keyword" on page 215
NOREUSE	GLOBAL	The NOREUSE keyword specifies that the image copy data sets that are cataloged in the system are not reused by the Image Copy function.	"NOREUSE keyword" on page 219
REGTIMESTMP	GLOBAL	The REGTIMESTMP keyword specifies how IMS HP Image Copy adds time stamps to output image copy data sets. This keyword is effective when FASTIC=(,FDUMP) is specified.	"REGTIMESTMP keyword" on page 226
RETPD	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The RETPD keyword specifies the RETPD (retention period) parameter for the output image copy data set.	"RETPD keyword" on page 228

Keyword	Statement	Description	Topic
RETPD2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The RETPD2 keyword specifies the RETPD (retention period) for the secondary output image copy data set.	“RETPD2 keyword” on page 229
RETPD*n*	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The RETPD*n* keyword specifies the RETPD (retention period) for the third to seventh output image copy data sets.	“RETPDn keyword” on page 230
VOLCNT	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VOLCNT keyword specifies the number of tape volumes used for the output image copy data set.	“VOLCNT keyword” on page 264
VOLSER	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VOLSER keyword specifies the volume serial number of the tape volume used for the primary data set of the output image copy.	“VOLSER keyword” on page 265
VOLSER2	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VOLSER2 keyword specifies the volume serial number of the tape volume used for the secondary data set of the output image copy.	“VOLSER2 keyword” on page 266
VOLSER*n*	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VOLSER*n* keywords specify the volume serial number of the tape volume used for the third to the seventh data sets of the output image copy.	“VOLSERn keyword” on page 266

Keywords for data set stacking

The following table summarizes the keywords for data set stacking.

Table 41: Keywords for data set stacking

Keyword	Statement	Description	Topic
OFFLDSTACK	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The OFFLDSTACK keyword specifies the ddname of the output stack that is created as the secondary image copy data set when the primary image copy is created in Fast Recovery image copy format by FASTIC=(,COPY) processing of Advanced Image Copy Services.	“OFFLDSTACK keyword” on page 223
RSTTYPE_STK	GLOBAL	The RSTTYPE_STK keyword controls the behavior of the restart processing for STACK processing.	“RSTTYPE_STK keyword” on page 231
STACK	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The STACK keyword requests image copy stacking. This keyword specifies the ddname of the output stacks.	“STACK keyword” on page 241
STACKBASE	GLOBAL	The STACKBASE keyword specifies whether to use a temporary name or the actual name when dynamically allocating the dummy data set used for stacking.	“STACKBASE keyword” on page 243

Keywords for Advanced Image Copy Services

The following table summarizes the keywords that are related to Advanced Image Copy Services.

Table 42: Keywords for Advanced Image Copy Services

Keyword	Statement	Description	Topic
DATA_MOVER	GLOBAL	The DATA_MOVER keyword defines the data mover utility for Advanced Image Copy Services.	“DATA_MOVER keyword” on page 173
DSSTEMP	GLOBAL	The DSSTEMP keyword specifies the name of the ICEFICO data set. The ICEFICO data set specifies the allocation information for the work data set used in FASTIC=(,DUMP) processing.	“DSSTEMP keyword” on page 185

Keyword	Statement	Description	Topic
FASTIC	GLOBAL	The FASTIC keyword enables Advanced Image Copy Services (using the DFSMSdss™ API) for creating image copies.	“FASTIC keyword” on page 190
OFFLDSTACK	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The OFFLDSTACK keyword specifies the ddname of the output stack that is created as the secondary image copy data set when the primary image copy is created in Fast Recovery image copy format by FASTIC=(,COPY) processing of Advanced Image Copy Services.	“OFFLDSTACK keyword” on page 223
OFFLDTYPE	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The OFFLDTYPE keyword specifies the type of the secondary image copy data set when the primary image copy is created in Fast Recovery image copy format by FASTIC=(,COPY) processing of Advanced Image Copy Services.	“OFFLDTYPE keyword” on page 224

Keywords for DBRC processing

The following table summarizes the keywords that are related to DBRC processing.

Table 43: Keywords for DBRC processing

Keyword	Statement	Description	Topic
BYPDBAUTH	GLOBAL	The BYPDBAUTH keyword specifies to bypass DBRC database authorization for index databases. This keyword is effective only when both VIC=Y and HDPC=N are specified.	“BYPDBAUTH keyword” on page 164
DBRC	GLOBAL	The DBRC keyword specifies to override the specification of DBRC in the IMSCTRL macro statement that is specified during IMS system definition.	“DBRC keyword” on page 178
NOTIFY	GLOBAL, GROUP	The NOTIFY keyword specifies to register output data sets to RECON.	“NOTIFY keyword” on page 220
NOTIFYMODE	GLOBAL	The NOTIFYMODE keyword specifies the condition for registering image copy record to RECON.	“NOTIFYMODE keyword” on page 221
VIC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VIC keyword specifies whether to process virtual image copies for primary and secondary index databases.	“VIC keyword” on page 263
VICDSN	GLOBAL, GROUP	The VICDSN keyword specifies the name of the dummy data set that is used as data in the UIC record of the virtual image copy. This dummy data set will be registered to DBRC.	“VICDSN keyword” on page 264

Keywords for Checkpoint Restart

The following table summarizes the keywords that are related to Checkpoint Restart.

Table 44: Keywords for Checkpoint Restart

Keyword	Statement	Description	Topic
RESTART	GLOBAL	The RESTART keyword specifies whether to enable Checkpoint Restart for automatic restart of image copy processing.	“RESTART keyword” on page 227
RSTTYPE	GLOBAL	The RSTTYPE keyword specifies the unit of restart for Checkpoint Restart.	“RSTTYPE keyword” on page 230

Keyword	Statement	Description	Topic
RSTTYPE_STK	GLOBAL	The RSTTYPE_STK keyword controls the behavior of the restart processing for STACK processing.	“RSTTYPE_STK keyword” on page 231

Keywords for creating compressed image copies

The following table summarizes the keywords for creating compressed image copies.

Table 45: Keywords for creating compressed image copies

Keyword	Statement	Description	Topic
COMP	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The COMP keyword specifies whether to compress output image copy data.	“COMP keyword” on page 167
COMPMODE	GLOBAL	The COMPMODE keyword controls the priority of the compression methods for compressing the output image copy data sets. This keyword is effective only when the IDRC feature is activated by the JCL or the system.	“COMPMODE keyword” on page 167
COMPRTN	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The COMPRTN keyword specifies the name of the compression routine that IMS HP Image Copy invokes to compress output image copy data.	“COMPRTN keyword” on page 169
ZIIPMODE	GLOBAL	The ZIIPMODE keyword specifies whether IMS HP Image Copy offloads eligible database workloads to zIIP processors.	“ZIIPMODE keyword” on page 269

Keywords for controlling application transaction status

The following table summarizes the keywords for controlling application transaction status.

Table 46: Keywords for controlling application transaction status

Keyword	Statement	Description	Topic
TOIAUTO	GLOBAL, GROUP, IC, AIC	The TOIAUTO keyword specifies whether IMS Tools Online System Interface issues IMS commands to stop and start the database before and after the batch image copy process.	“TOIAUTO keyword” on page 252
TOIAUTO_Q	GLOBAL	The TOIAUTO_Q keyword specifies whether IMS Tools Online System Interface issues database quiesce commands before and after the batch image copy process.	“TOIAUTO_Q keyword” on page 255
TOIAUTO_STA	GLOBAL	The TOIAUTO_STA keyword specifies the offline database to start after IMS HP Image Copy creates batch image copies.	“TOIAUTO_STA keyword” on page 256
TOIRETRY	GLOBAL	The TOIRETRY keyword specifies whether IMS HP Image Copy reissues the IMS command to stop the database. The keyword also specifies the maximum number of retries.	“TOIRETRY keyword” on page 257
TOITIME	GLOBAL	The TOITIME keyword specifies the time value that is used to retrieve the response from the IMS Tools Online System Interface.	“TOITIME keyword” on page 258
TOITIME_Q	GLOBAL	The TOITIME_Q keyword specifies the timeout value for IMS database quiesce commands.	“TOITIME_Q keyword” on page 258
TOIXCFGR	GLOBAL	The TOIXCFGR keyword identifies the XCF group that the IMS Tools Online System Interface uses to interface with IMS HP Image Copy.	“TOIXCFGR keyword” on page 259

Keyword	Statement	Description	Topic
TOSIXCFGRP	GLOBAL	The TOSIXCFGRP keyword identifies the XCF group that the IMS Tools Online System Interface uses to interface with IMS HP Image Copy. This keyword functions identically to the TOIXCFGR keyword.	"TOSIXCFGRP keyword" on page 260

Keywords for group processing

The following table summarizes the keywords for group processing.

Table 47: Keywords for group processing

Keyword	Statement	Description	Topic
CAGRP	GROUP	The CAGRP keyword specifies the name of the change accumulation group (CA group) that is registered to the DBRC RECON data set.	"CAGRP keyword" on page 165
DBDSGRP	GROUP	The DBDSGRP keyword specifies the name of the database data set group (DBDS) that is registered to the DBRC RECON data set.	"DBDSGRP keyword" on page 177
FUNC	GROUP	The FUNC keyword specifies the function to be performed by IMS HP Image Copy for all data set groups or areas that are defined by the CAGRP keyword or the DBDSGRP keyword.	"FUNC keyword" on page 192
GRPLIM	GLOBAL, GROUP	The GRPLIM keyword specifies the maximum number of tasks to be processed in parallel within a group.	"GRPLIM keyword" on page 194

Keywords for processing index databases

The following table summarizes the keywords for processing index databases.

Table 48: Keywords for processing index databases

Keyword	Statement	Description	Topic
BYPDBAUTH	GLOBAL	The BYPDBAUTH keyword specifies to bypass DBRC database authorization for index databases. This keyword is effective only when both VIC=Y and HDPC=N are specified.	"BYPDBAUTH keyword" on page 164
CIC_KSDS	GLOBAL	The CIC_KSDS keyword specifies whether the concurrent image copy process creates image copy data sets when the processed data sets are key-sequenced data sets (KSDS). This keyword is ignored if the concurrent image copy process is requested with Advanced Image Copy Services.	"CIC_KSDS keyword" on page 166
DBALL	GLOBAL	The DBALL keyword specifies to search logical group DBDSs automatically.	"DBALL keyword" on page 173
IDXSRCH	GLOBAL	The IDXSRCH keyword specifies to search for related index DBDS while it creates virtual image copies (VIC).	"IDXSRCH keyword" on page 211
VIC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VIC keyword specifies whether to process virtual image copies for primary and secondary index databases.	"VIC keyword" on page 263

Keywords for HASH Check

The following table summarizes the keywords that are related to HASH Check.

Table 49: Keywords for HASH Check			
Keyword	**Statement**	**Description**	**Topic**
DEDBPC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The DEDBPC keyword enables the HASH Check option of the DEDB Pointer Checker utility.	“DEDBPC keyword” on page 179
GROUPDIGITS	GLOBAL	The GROUPDIGITS keyword specifies whether to enable or disable digit grouping for the numeric values printed in Database Statistics reports and Partition Statistics reports of HD Pointer Checker, which are generated by HASH Check.	“GROUPDIGITS keyword” on page 194
HDPC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The HDPC keyword enables the pointer check function (HASH Check) of HD Pointer Checker.	“HDPC keyword” on page 196
HOMECHK	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The HOMECHK keyword specifies to print the DISTRIBUTION OF ROOT SEGMENTS part in the DB Record Distribution Statistics report of HD Pointer Checker.	“HOMECHK keyword” on page 198
IXKEYCHK	GLOBAL	The IXKEYCHK keyword invokes the Index key HASH Check of the HD Pointer Checker utility.	“IXKEYCHK keyword” on page 213
SPMN	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The SPMN keyword specifies whether to invoke the Space Monitor function of IMS HP Pointer Checker to monitor the database data sets.	“SPMN keyword” on page 240
THRESHOLDS	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The THRESHOLDS keyword specifies the threshold values for monitoring database status with the Space Monitor function of IMS HP Pointer Checker.	“THRESHOLDS keyword” on page 247
T2CHK	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The T2CHK keyword specifies the two threshold values that are used by the HD Pointer Checker HASH pointer check option to define how the slack bytes or unknown data is treated as T2 records.	“T2CHK keyword” on page 260
USER	GLOBAL	The USER keyword specifies the TSO user IDs to which the HD Pointer Checker utility sends a notification message when a pointer error or a T2 error is detected.	“USER keyword” on page 262
VIC	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The VIC keyword specifies whether to process virtual image copies for primary and secondary index databases.	“VIC keyword” on page 263

Keywords for DB Sensor

The following table summarizes the keywords for DB Sensor.

Table 50: Keywords for DB Sensor			
Keyword	**Statement**	**Description**	**Topic**
ADXCFGRP	GLOBAL	The ADXCFGRP keyword specifies the Autonomics Director XCF group name. The name is used to send a sensor data notification to Autonomics Director when the sensor data is stored in the Sensor Data repository of IMS Tools KB.	“ADXCFGRP keyword” on page 162
ITKBLOAD	GLOBAL	The ITKBLOAD keyword specifies the IMS Tools KB load module data set.	“ITKBLOAD keyword” on page 212
ITKBSRVR	GLOBAL	The ITKBSRVR keyword specifies the name of the IMS Tools KB server XCF group.	“ITKBSRVR keyword” on page 213

Keyword	Statement	Description	Topic
SENSOR	GLOBAL	The SENSOR keyword specifies to store sensor data in the Sensor Data repository of IMS Tools Knowledge Base (IMS Tools KB).	“SENSOR keyword” on page 232
SENSOR_HOME	GLOBAL	The SENSOR_HOME keyword specifies whether to collect the data elements that are related to root segment distribution and store them in the Sensor Data repository of IMS Tools KB. This keyword is effective only for full-function databases.	“SENSOR_HOME keyword” on page 233

Keywords for storing reports in the IMS Tools KB repository

The following table summarizes the keywords for enabling the IMS Tools KB repository for storing reports.

Table 51: Keywords for storing reports in the IMS Tools KB repository

Keyword	Statement	Description	
ITKBLOAD	GLOBAL	The ITKBLOAD keyword specifies the IMS Tools KB load module data set.	“ITKBLOAD keyword” on page 212
ITKBSRVR	GLOBAL	The ITKBSRVR keyword specifies the name of the IMS Tools KB server XCF group.	“ITKBSRVR keyword” on page 213

Keywords for buffer tuning

The following table summarizes the keywords for buffer tuning. Also see “Performance tips for IMS HP Image Copy” on page 385 to tune the buffers to achieve optimal performance.

Table 52: Keywords for buffer tuning

Keyword	Statement	Description	Topic
DBBUF	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The DBBUF keyword specifies the number of buffers to be used to access the database data set groups or areas.	“DBBUF keyword” on page 175
DSBUF	GLOBAL	The DSBUF keyword specifies the number of buffers to be used to access the input data set.	“DSBUF keyword” on page 181
ICBUF	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The ICBUF keyword specifies the number of buffers to be used to access the output image copy data sets.	“ICBUF keyword” on page 200

Keywords for controlling shadow data sets

The following table summarizes the keywords for controlling shadow data sets.

Table 53: Keywords for controlling shadow data sets

Keyword	Statement	Description	Topic
SHDWDELETE	GLOBAL	The SHDWDELETE keyword specifies when to delete shadow data sets.	“SHDWDELETE keyword” on page 234
SHDWDSN	GLOBAL	The SHDWDSN keyword specifies the naming template for the shadow data sets that IMS HP Image Copy dynamically allocates.	“SHDWDSN keyword” on page 235
SHDWHLQ	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The SHDWHLQ keyword specifies the data set name prefix for the shadow data sets.	“SHDWHLQ keyword” on page 235

Keyword	Statement	Description	Topic
SHDWMGMTCL	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The SHDWMGMTCL keyword specifies the name of the management class for the new SMS-managed shadow data sets that IMS HP Image Copy dynamically allocates.	“SHDWMGMTCL keyword” on page 236
SHDWSTORCL	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The SHDWSTORCL keyword specifies the name of the storage class for the new SMS-managed shadow data sets that IMS HP Image Copy dynamically allocates.	“SHDWSTORCL keyword” on page 237
SHDWTCTL	GLOBAL	The SHDWTCTL keyword specifies the maximum number of shadow data set creation tasks that can run in parallel.	“SHDWTCTL keyword” on page 237
SHDWVOLSER	GLOBAL, GROUP, IC, AIC, CIC, ACIC	The SHDWVOLSER keyword specifies the volume serial number of the DASD volume on which the shadow data sets are created.	“SHDWVOLSER keyword” on page 238
SHDW_ERROR	GLOBAL	The SHDW_ERROR keyword specifies whether the image copy processing continues or stops when the creation of the shadow data set fails.	“SHDW_ERROR keyword” on page 239

Keywords for error handling

The following table summarizes the keywords for error handling.

Table 54: Keywords for error handling

Keyword	Statement	Description	Topic
DEL_ICDS	GLOBAL	The DEL_ICDS keyword specifies the image copy data set of the database data set be deleted when an error occurs in the image copy process of the database data set.	“DEL_ICDS keyword” on page 180
DRSNDSN	GLOBAL	The DRSNDSN keyword specifies the name of the data set that contains FABJDRSN control statements, which define the error reason codes and SMS reason codes of dynamic allocation.	“DRSNDSN keyword” on page 181
FALLBACK	GLOBAL	The FALLBACK keyword internally switches the batch image copy process to the concurrent image copy process when exclusive authorization of the input database is not granted during the batch image copy process.	“FALLBACK keyword” on page 189
IC_ERROR	GLOBAL	The IC_ERROR keyword specifies to terminate all image copy processes for all database data sets when an error occurs in one of the image copy processes.	“IC_ERROR keyword” on page 210
RETCDDSN	GLOBAL	The RETCDDSN keyword specifies the name of the data set that contains HPSRETCD control statements, which define the return codes of IMS HP Image Copy processes.	“RETCDDSN keyword” on page 228
WAITALOC	GLOBAL	The WAITALOC keyword specifies whether to display the WAIT option in message IEF238D when dynamic allocation on the tape unit fails.	“WAITALOC keyword” on page 267
WAITMSG	GLOBAL	The WAITMSG keyword specifies whether to display WTO message FABJ3929A on the operator console until dynamic allocation is done on the tape unit.	“WAITMSG keyword” on page 268
WAITTIME	GLOBAL	The WAITTIME keyword specifies the wait time for repeating the dynamic allocation on the tape unit when the dynamic allocation reason code (SVC99) is 214, 220, 228, or 484.	“WAITTIME keyword” on page 268

Multiple-step HASH Check option reference

The multiple-step HASH Check option requires the DBD Analysis program and the HASH Evaluation program to be run.

> **Attention:** In an IMS-managed ACBs environment, multiple-step HASH Check for full-function databases is not supported.

DBD Analysis program reference

To enable the Multiple-step HASH Check option, you must prepare a DBDEFCTL data set. To prepare this data set, run the HD Pointer Checker DBD Analysis program on all databases whose pointers you want to validate with the HASH Check option.

This program extracts the database definition information from the PSB and the DBD, and writes it into the DBDEFCTL data set, which is used by the Image Copy function with the HASH Check option and the HASH Evaluation program.

The extracted database information is stored in a single member of the DBDEFCTL data set for each database. PSB information is stored as one member. If you specify the member name with the DBDEFCTL keyword, the control information member is created with that name. If the member name is omitted, member name PROCTL01 is used as the default. Do not use a database name as the control information member name.

If the database structure has been changed, you must run the DBD Analysis program to update the database information for all databases to be checked.

Subtopics:

- "Utility control statements" on page 102
- "DD statements" on page 103

Utility control statements

If you have utility control statements in the PROCCTL data set that work well for a stand-alone HD Pointer Checker HASH Check option job, you can use them for the DBD Analysis program input. No change is required.

If you want to code new utility control statements for your DBD Analysis program job, you can apply the syntax described in the *IMS High Performance Pointer Checker User's Guide*.

However, the purpose of this program is to generate the DBDEFCTL data set, which is required by the subsequent run of the Image Copy function with the HASH Check option and HASH Evaluation program steps. Thus, the **HASH=YES** or **HASH=FORCE** parameter is required. If it is not specified, the DBD Analysis program ends with a return code of 8. If none of the specified databases can be checked with the HASH Check option, the DBD Analysis program also ends.

DBDEFCTL=*name*

Optional keyword for the PROC statement in the PROCCTL data set. Specify the PDS member name of the control information. The name is 1- to 8-alphanumeric or national characters ($, #, and @). If you do not specify the name, **PROCTL01** is used as the default member name.

The following table lists the parameters. The values shown in the right column are always used regardless of the specifications in the control statements.

Table 55: Parameters to specify the control information member name

Parameter	Specification
PROC SEP **OPTION** PTRCHK	YES

Parameter	Specification
PROC IXKEYCHK SYMIXCHK SYMLPCHK VLSSUMM EPSCHK CHECKREC **OPTION** HOMECHK INCORE KEYSIN ZEROCTR SPIXCHK SPMN **REPORT** DBDIST CHAINDIST DECODEDBD MAPDBD COMPFACT SEGIO	NO
PROC TYPE	SCAN
PROC CHECK	(CHK,111111)
PROC ITKBSRVR ITKBLOAD	*NO
DATABASE DATASET	REAL
PROC RETCDDSN USER **DATABASE** SCANGROUP BLOCKDUMP **OPTION** NOCHKP VSAMBF DSSIZE ICUNIT IBUFF	The specification is ignored.

DD statements

To run the DBD Analysis program, supply an EXEC statement and the appropriate DD statements that define the input and output data sets.

The following table summarizes the DD statements for the DBD Analysis program.

Table 56: DBD Analysis program DD statements

DDNAME	Use	Format	Need
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMS	Input	PDS	Required
IMS2	Input	PDS	Optional
SYSPRINT	Output	SYSOUT	Optional
SYSUDUMP	Output	SYSOUT	Optional
DFSVSAMP	Input	LRECL=80	Required
DBDEFCTL	Output	PDS	Required
PRIMAPRT	Output	LRECL=133	Required
SNAPPIT	Output	LRECL=133	Optional

DDNAME	Use	Format	Need
PROCCTL	Input	LRECL=80	Required
RECON*x*	Input	KSDS	Optional

STEPLIB DD

This statement points to the HD Pointer Checker load module library data sets. Data sets must be in the following order:

```
//STEPLIB  DD   DISP=SHR,DSN=pgmlib
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

pgmlib is the name of the library that contains the HD Pointer Checker load modules. IMS.SDFSRESL is the name of the library that contains the IMS nucleus and required action modules.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMS DD

This statement defines the library that contains the PSB library and the DBD library. It must contain all DBDs that are referred to by your PSB. If your PSB and DBDs are not in the same library, all appropriate libraries must be concatenated.

IMS2 DD

This statement defines the library that contains the FABPZWTO user exit, the partition selection exit module, or both. The data set must reside on a direct-access volume. It is required if you want to use FABPZWTO, the partition selection exit, or both.

SYSPRINT DD

This statement defines the output messages data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 121.

SYSUDUMP DD

This statement defines the optional output data set that defines the output from a system ABEND dump routine. It is used only when a dump is required. Although this statement is optional, you should include this data set.

DFSVSAMP DD

This statement describes the data set that contains the buffer information required by the DL/I buffer handler.

DBDEFCTL DD

This statement defines the required output partitioned data set to be used as input to the Image Copy function with the HASH Check option and the HASH Evaluation program. This data set contains database definition information for each database as a PDS member named with each DBD name, as well as the information for the HASH Check option process control. The member name of the control information must be specified with the DBDEFCTL parameter of the utility control statement. Do not specify the DCB information on the DD statement. If specified, it is ignored.
Access to the DBDEFCTL data set by an Image Copy job of IMS HP Image Copy and by a HASH evaluation job is restricted to read-only. This data set is reusable until you change the content.

PRIMAPRT DD

This statement defines the output data set that contains the primary reports. It is required. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SNAPPIT DD

This statement defines the output data set that contains the internal control blocks, if DIAG=YES is specified. This statement is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

PROCCTL DD

This statement defines the input control statement data set. The data set can reside on a tape or a direct-access volume; or it can be routed through the input steam (DD * or DD DATA).

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

HASH Evaluation program reference

The HASH Evaluation program is used only by the multiple-step HASH Check option to evaluate the pointers of image copy data sets.

Subtopics:

- "Utility control statements" on page 105
- "DD statements" on page 105

Utility control statements

No utility control statement is needed to run the HASH Evaluation program.

DD statements

To run the HASH Evaluation program, supply an EXEC statement and the appropriate DD statements that define the input and output data sets.

The following table summarizes the DD statements.

Table 57: The HASH Evaluation program DD statements

DDNAME	Use	Format	Need
STEPLIB	Input	PDS	Optional
SYSPRINT	Output	SYSOUT	Required
SYSUDUMP	Output		Optional
DBDEFCTL	Output	PDS	Required
PRIMAPRT	Output	LRECL=133	Optional
EVALUPRT	Output	LRECL=133	Required
SUMMARY	Output	LRECL=133	Optional
SORTIN	Input		Required
HISTORY	Input/Output	KSDS	Optional
IMS	Input	PDS	Required if PGM=DFSRRC00
IMS2	Input	PDS	Optional if PGM=DFSRRC00
DFSRESLIB	Input	PDS	Required if PGM=DFSRRC00
DFSVSAMP	Input		Required if PGM=DFSRRC00
RECON*x*	Input	KSDS	Optional if PGM=DFSRRC00

STEPLIB DD

This statement points to the load module library data set of HD Pointer Checker.

SYSPRINT DD

This statement defines the output messages data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 121.

SYSUDUMP DD

This statement defines the optional output data set that defines the output from a system ABEND dump routine. It is used only when a dump is required. Although this statement is optional, you should include this data set.

DBDEFCTL DD

This statement defines the required input partitioned data set created by a preceding DBD Analysis program job. This data set contains the database definition information for each database as a PDS member named with each DBD name, and the process control information for the HD Pointer Checker HASH Check function. Specify the member name of the process control information with the DSNAME (or DSN) keyword as follows:

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL(member)
```

If the member name is not specified (see the following example), the default member name PROCTL01 is used for the control information.

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL
```

PRIMAPRT DD

This statement defines the output data set containing the primary reports. It is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

EVALUPRT DD

This statement defines the output data set containing the evaluation reports. It is required. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SUMMARY DD

This statement defines the output data set containing the summary reports. It is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SORTIN DD

This statement specifies the input HASH record data sets created by the preceding Image Copy function with the HASH Check function jobs. A complete set of the HASH record data sets must be concatenated on the DD statement. Otherwise, the HASH Evaluation program process might not be completed and erroneous pointer error messages might be issued.

IMS DD

This statement defines the library that contains the PSB library and the DBD library. It must contain all DBDs that are referred to by your PSB. If your PSB and DBDs are not in the same library, all appropriate libraries must be concatenated.

IMS2 DD

This statement defines the library that contains the FABPZWTO user exit, the partition selection exit module, or both. The data set must reside on a direct-access volume. It is required if you want to use FABPZWTO, the partition selection exit, or both.

HISTORY DD

This optional data set defines the HISTORY data set (VSAM KSDS) that is used as input to the DB Historical Data Analyzer and Space Monitor of IMS HP Pointer Checker. When the HISTORY option is specified, this data set is required, and must be allocated and initialized by the DB Historical Data Analyzer utility before you run IMS HP Image Copy. DISP=SHR must be used. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

DFSRESLIB DD

This statement points to an authorized library that contains the IMS SVC modules.

DFSVSAMP DD

This statement describes the data set that contains the buffer information required by the DL/I buffer handler.

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

Examples for the Image Copy function

The following topics provide examples for using the Image Copy function with the FABJMAIN program.

To use DBRC without dynamically allocating the RECON data sets, you must add the DD statements for the DBRC RECON data sets, as shown in the following figure:

Figure 17: Sample DD statements for DBRC RECON data sets

```
//RECON1   DD  DSNAME=RECON1,DISP=SHR
//RECON2   DD  DSNAME=RECON2,DISP=SHR
//RECON3   DD  DSNAME=RECON3,DISP=SHR
```

Examples for parallel processing

Use the following examples to enable parallel processing in an image copy job.

In the examples in topic, the following condition is assumed:

- CAGROUP CAG1 consists of the database data sets listed in the following table.

Table 58: Databases in CAGROUP CAG1

DBD	DDN
DBHDAM1	HDAM1DD1
DBHDAM2	HDAM2DD1
DBHDAM3	HDAM3DD1

- DBD: DBHDAM4 consists of 2 DSGs: HDAM4DD1 and HDAM4DD2.

Subtopics:

- “Example 1: Group processing in parallel” on page 107
- “Example 2: WAIT statement” on page 107
- “Example 3: STACK processing in parallel” on page 108
- “Example 4: TASKCTL” on page 108

Example 1: Group processing in parallel

This example is for a simple IC parallel process.

ICEIN statements:

```
GROUP FUNC=AIC,CAGRP=CAG1,ICOUT=*
AIC   DBD=DBHDAM4,ICOUT=*
```

Result:

The Image Copy function would process as follows:

- All five data sets are processed in parallel.
- Five tasks start at once.

Example 2: WAIT statement

This example shows how the WAIT statement works in the IC process.

ICEIN statements:

```
AIC   DBD=DBHDAM4,DDN=HDAM4DD1,ICOUT=*
GROUP FUNC=AIC,CAGRP=CAG1,ICOUT=*
WAIT
AIC   DBD=DBHDAM4,DDN=HDAM4DD2,ICOUT=*
```

Result:

The Image Copy function would process as follows:

- First, processes of four data sets (HDAM4DD1, HDAM1DD1, HDAM2DD1, and HDAM3DD1) start in parallel.

- Process for data set HDAM4DD2 is not started until the four previously started processes are ended.
- First, four tasks start in parallel.
- When the first four tasks end, the next task starts.

Example 3: STACK processing in parallel

This example shows how the STACK option works in the IC process.

ICEIN statements:

```
AIC   DBD=DBHDAM4,DDN=HDAM4DD1,STACK=STK1
GROUP FUNC=AIC,CAGRP=CAG1,STACK=STK2
AIC   DBD=DBHDAM4,DDN=HDAM4DD2,ICOUT=STK1
```

Result:

The Image Copy function would process as follows:

- First, processes of two data sets (HDAM4DD1 and HDAM1DD1) start in parallel.
- Data sets in CAG1 are written into STK2 sequentially.
- Process for data set HDAM4DD2 starts after terminating the DBD=DBHDAM4,DDN=HDAM4DD1 task, even if the GROUP process is ended.

Example 4: TASKCTL

This example shows how the TASKCTL optional keyword works in the IC process.

ICEIN statements:

```
GLOBAL DBRC=Y,TASKCTL=3
GROUP FUNC=AIC,CAGRP=CAG1,ICOUT=*
AIC   DBD=DBHDAM4,ICOUT=*
```

Result:

The Image Copy function would process as follows:

- First, processes of three data sets (HDAM1DD1, HDAM2DD1, and HDAM3DD1) start in parallel.
- Process for data set HDAM4DD1 starts after any of the processes HDAM1DD1, HDAM2DD1, or HDAM3DD1 is ended.

Examples for enabling dynamic allocation

Use the following examples to enable dynamic allocation for the Image Copy function.

Subtopics:

- “Example 1: Creating image copies—dynamic allocation enabled” on page 108
- “Example 2: Creating image copies—dynamic allocation disabled” on page 109
- “Example 3: Creating and stacking image copies—dynamic allocation enabled” on page 109
- “Example 4: Creating and stacking image copies of DBDSGRP—dynamic allocation enabled” on page 110

Example 1: Creating image copies—dynamic allocation enabled

The following figure is an example for invoking FABJMAIN to run the Image Copy function with dynamic allocation.

Figure 18: JCL example for creating image copies —dynamic allocation enabled

```
//EXAMPLE1 JOB
//         EXEC PGM=FABJMAIN
//STEPLIB  DD DISP=SHR,DSN=HPS.HPSLMD0
//         DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
```

```
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//IMSDALIB DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//DFSPRINT DD SYSOUT=*
//ICEPRINT DD SYSOUT=*
//ICEIN    DD *
  GLOBAL UNIT=TAPE,VOLCNT=99,ICHLQ=ICOUT.DBT
  IC     DBD=HDAMDB01,DDN=HDAMDD01,ICOUT=*
  IC     DBD=HDAMDB01,DDN=HDAMDD02,ICOUT=*
/*
```

The data set groups (DDN=HDAMDD01 and HDAMDD02) of the input database (DBD=HDAMDB01) are dynamically allocated by the Image Copy function by using the DFSMDA members.

The output image copy data sets, one for each data set group, are also dynamically allocated by the Image Copy function. The data set name of each image copy is determined by IMS HP Image Copy as follows:

- Image copy for HDAMDD01: ICOUT.DBT.IC1.HDAMDB01.HDAMDD01
- Image copy for HDAMDD02: ICOUT.DBT.IC1.HDAMDB01.HDAMDD02

Each image is allocated to a tape device through the nonspecific volume request and as a result, the non-stacked image copies are created.

Example 2: Creating image copies—dynamic allocation disabled

The following figure is an example for invoking FABJMAIN to run the Image Copy function without dynamic allocation:

Figure 19: JCL example for creating image copies —dynamic allocation disabled

```
//EXAMPLE2 JOB
//         EXEC PGM=FABJMAIN
//STEPLIB  DD DISP=SHR,DSN=HPS.SHPSLMD0
//         DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//DFSPRINT DD SYSOUT=*
//ICEPRINT DD SYSOUT=*
//ICEIN    DD *
  IC     DBD=HDAMDB01,DDN=HDAMDD01,ICOUT=HDAMIC01
  IC     DBD=HDAMDB01,DDN=HDAMDD02,ICOUT=HDAMIC02
/*
//HDAMDD01 DD DISP=OLD,DSN=DB.HDAMDD01
//HDAMDD02 DD DISP=OLD,DSN=DB.HPDADD02
//HDAMIC01 DD DISP=(NEW,KEEP),DSN=IMSIC.HDAMDB01.HDAMDD01.IC,
//  UNIT=TAPE,VOL=(PRIVATE,RETAIN,,99)
//HDAMIC02 DD DISP=(NEW,KEEP),DSN=IMSIC.HDAMDB01.HDAMDD02.IC,
//  UNIT=TAPE,VOL=(PRIVATE,RETAIN,,99)
```

IMS HP Image Copy does not use the allocation information provided by such parameters as ICUNIT, VOLCNT, VOLSER. You must provide complete DD statements for the image copy data sets.

Example 3: Creating and stacking image copies—dynamic allocation enabled

The following figure is an example for invoking FABJMAIN to run the Image Copy function to create stacked image copies with dynamic allocation.

Figure 20: JCL example for creating and stacking image copies—dynamic allocation enabled

```
//EXAMPLE3 JOB
//         EXEC PGM=FABJMAIN
//STEPLIB  DD DISP=SHR,DSN=HPS.SHPSLMD0
//         DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//IMSDALIB DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//DFSPRINT DD SYSOUT=*
//ICEPRINT DD SYSOUT=*
//ICEIN    DD *
  GLOBAL UNIT=TAPE,VOLCNT=99,ICHLQ=IMSIC
  IC     DBD=HDAMDB01,DDN=HDAMDD01,STACK=STACK1
  IC     DBD=HDAMDB01,DDN=HDAMDD02,STACK=STACK1
/*
```

The data set groups (DDN=HDAMDD01 and HDAMDD02) of the input database (DBD=HDAMDB01) are dynamically allocated by the Image Copy function by using the DFSMDA members.

The output image copy data sets, one for each data set group, are also dynamically allocated by the Image Copy function. The data set name of each image copy is determined by IMS HP Image Copy as follows:

- Image copy for HDAMDD01: IMSIC.IC1.HDAMDB01.HDAMDD01.D*yyddd*.T*hhmmss*
- Image copy for HDAMDD02: IMSIC.IC1.HDAMDB01.HDAMDD02.D*yyddd*.T*hhmmss*

where:

yyddd

Year and day.

hhmmss

Time in time stamp format.

Both image copies are allocated to one tape device through the nonspecific volume request. Two image copy data sets are stacked into one stack STACK1 and created on one or more tape volumes (up to 99).

Example 4: Creating and stacking image copies of DBDSGRP—dynamic allocation enabled

The following figure is an example for invoking FABJMAIN to run the Image Copy function to create stacked image copies of a DBDSGRP with dynamic allocation:

Figure 21: JCL example for creating and stacking image copies of DBDSGRP—dynamic allocation enabled

```
//EXAMPLE4 JOB
//         EXEC PGM=FABJMAIN
//STEPLIB  DD DISP=SHR,DSN=HPS.SHPSLMD0
//         DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//IMSDALIB DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//DFSPRINT DD SYSOUT=*
//ICEPRINT DD SYSOUT=*
//ICEIN    DD *
  GLOBAL UNIT=TAPE,VOLCNT=99,ICHLQ=IMSIC
  GROUP  DBDSGRP=DBDSGRP1,STACK=STACK1,FUNC=IC
/*
```

The data set groups defined in the DBDS group (DBDSGRP=DBDSGRP1) are dynamically allocated by the Image Copy function by using the DFSMDA members.

The output image copy data sets, one for each data set group, are also dynamically allocated by the Image Copy function. The data set name of each image copy is determined by IMS HP Image Copy as follows:

- Image copy for DBDNAME=*dbdname,* DDNAME=*ddname:*
  IMSIC.IC1.*dbdname.ddname.*D*yyddd*T*hhmmss*

where:

yyddd

Year and day.

hhmmss

Time in time stamp format.

All image copies are allocated to one tape device through the nonspecific volume request and all image copy data sets are stacked into one stack STACK1 and created on one or more tape volumes (up to 99).

Examples for enabling Advanced Image Copy Services

Use the following examples to enable the Advanced Image Copy Services for the Image Copy function.

Subtopics:

- “Example 1: Creating image copies with the FASTIC=DUMP option” on page 111
- “Example 2: Creating image copies with the FASTIC=COPY option” on page 111

- "Example 3: Creating image copies with the FASTIC=FDUMP option" on page 111

Example 1: Creating image copies with the FASTIC=DUMP option

The following figure shows how to invoke FABJMAIN to run the Image Copy function using FASTIC=DUMP processing.

The example shows that the data set group (DDN=HDAMDD01 and HDAMDD02) of the input database (DBDE=HDAMDB01) will be dynamically allocated using the DFSMDA members. The output image copy data sets, one for each data set group, are also dynamically allocated. The image copies will be generated using the DFSMSdss™ API. Because FASTIC=(PREF,) is specified, the image copies will be created even if none of the Advanced Image Copy Services are available.

Figure 22: Creating image copies using FASTIC=DUMP processing

```
//EXAMPLE1   JOB
//           EXEC PGM=FABJMAIN
//STEPLIB    DD DISP=SHR,DSN=HPS.HPSLMD0
//           DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB   DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS        DD DISP=SHR,DSN=IMS.DBDLIB
//IMSDALIB   DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//DFSPRINT   DD SYSOUT=*
//ICEPRINT   DD SYSOUT=*
//ICEIN      DD *
  GLOBAL   UNIT=TAPE,VOLCNT=99,ICHLQ=ICOUT.DBT,FASTIC=(PREF,DUMP)
  IC       DBD=HDAMDB01,DDN=HDAMDD01,ICOUT=*
  IC       DBD=HDAMDB01,DDN=HDAMDD02,ICOUT=*
```

Example 2: Creating image copies with the FASTIC=COPY option

The following figure shows how to invoke FABJMAIN to run the Image Copy function using FASTIC=COPY processing.

The example shows that the data set group (DDN=HDAMDD01 and HDAMDD02) of the input database (DBD=HDAMDB01) will be dynamically allocated using the DFSMDA members. The output image copy data sets, one for each data set group, are also dynamically allocated. The image copy data set names will be the following:

- Image copy for HDAMDD01: ICOUT.DBT.HDAMDB01.HDAMDD01.FC1
- Image copy for HDAMDD02: ICOUT.DBT.HDAMDB01.HDAMDD02.FC1

Because FASTIC=(REQ,) is specified, the image copies will be created only if one of the Advanced Image Copy Services is available.

Figure 23: Creating image copies using FASTIC=COPY processing

```
//EXAMPLE2   JOB
//           EXEC PGM=FABJMAIN
//STEPLIB    DD     DISP=SHR,DSN=HPS.HPSLMD0
//           DD     DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB   DD     DISP=SHR,DSN=IMS.SDFSRESL
//IMS        DD     DISP=SHR,DSN=IMS.DBDLIB
//IMSDALIB   DD     DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//DFSPRINT   DD     SYSOUT=*
//ICEPRINT   DD     SYSOUT=*
//ICEIN      DD     *
  GLOBAL     UNIT=SYSDA,VOLSER=HPICR0,ICHLQ=ICOUT.DBT,FASTIC=(REQ,COPY),
             DSN=&ICHLQ..&DBD..&DDN..FC1
  IC         DBD=HDAMDB01,DDN=HDAMDD01,ICOUT=*
  IC         DBD=HDAMDB01,DDN=HDAMDD02,ICOUT=*
```

Example 3: Creating image copies with the FASTIC=FDUMP option

The following figures show how to invoke FABJMAIN to run the Image Copy function using FASTIC=FDUMP processing.

The following figure is an example for creating shadow data sets on a specific volume using the SHDWVOLSER keyword.

Figure 24: Creating shadow data sets on a specific volume

```
//ICEIN    DD *
  GLOBAL DBRC=Y,
         HDPC=Y,
         DEDBPC=Y,
         COMP=Y,
         VIC=N,
         UNIT=SYSDA,
         VOLSER=DBT00B,
*
         FASTIC=(REQ,FDUMP),
         REGTIMESTMP=SAME,
*
         SPACE=(TRK,5,1,RLSE),
         DSN=&ICHLQ..&DBD..&DDN..IC1,
         DSN2=&ICHLQ..&DBD..&DDN..IC2,
         ICHLQ=TEMPDS
*
         SHDWDSN=&SHDWHLQ..&DBD..&DDN..SHDW,
         SHDWHLQ=TEMPDS,
         SHDWVOLSER=DBT00C,
         SHDWDELETE=EACH,
         SHDWTCTL=10
*
   IC    DBD=DBHDAM30,
         DDN=HDAMDD30,
         ICOUT=*
*
   IC    DBD=DEDBJN23,
         AREA=DB23AR0,
         ICOUT=*
   ...
```

The following figure is an example of creating shadow data sets with a specific SMS class using the SHDWMGMTCL keyword and the SHDWSTORCL keyword.

Figure 25: Creating shadow data sets with a specific SMS class

```
//ICEIN    DD  *
  GLOBAL  COMP=Y,
          COMPRTN=FABJCMP4,
          DBRC=Y,
          DEDBPC=Y,
          HDPC=Y,
          DSN=&ICHLQ..&DBD..&DDN..IC1,
          DSN2=&ICHLQ..&DBD..&DDN..IC2,
          ICHLQ=TEMPDS.RGV11040,
          HPIO=Y,
          ICOUT=(*,*),
*
          FASTIC=(PREF,FDUMP),
          REGTIMESTMP=DIFFER,
*
          DATACLAS=DCIC01,
          DATACLAS2=DCIC02,
          MGMTCLAS=MCIC01,
          MGMTCLAS2=MCIC02,
          STORCLAS=SCIC01,
          STORCLAS2=SCIC02,
          SPACE=(TRK,20,1),
*
          SHDWDSN=&SHDWHLQ..&DBD..&DDN..SHDW,
          SHDWHLQ=TEMPDS,
          SHDWDELETE=ALL,
          SHDWMGMTCL=SDWM01,
          SHDWSTORCL=SDWS01,
          SHDWTCTL=10
*
  ACIC    DBD=DBHDAM50,DDN=HDAMDD51
  ACIC    DBD=DBHDAM50,DDN=HDAMDD52
  ...
```

Examples for enabling the HD Pointer Checker HASH Check option

Use the following examples to enable the HD Pointer Checker HASH Check option for the Image Copy function.

Subtopics:

- “Example 1: Creating image copies—single-step HASH Check option enabled” on page 113
- “Example 2: Creating image copies—multiple-step HASH Check in a single job” on page 113
- “Example 3: Creating image copies—multiple-step HASH Check in multiple job steps” on page 114

Example 1: Creating image copies—single-step HASH Check option enabled

The following figure shows a JCL example for an Image Copy job for HDAM databases. The HASH Check option is enabled. This job creates image copies of four database data sets, and does HASH Check, in a single step.

Figure 26: Example of Image Copy JCL—single-step HASH Check

```
//DBDUMP    JOB
//DBDUMP    EXEC FABPICHE
//HDAMDS1   DD DISP=OLD,DSN=HD00180.HDAMDS1
//HDAMDS2   DD DISP=OLD,DSN=HD00180.HDAMDS2
//DBOUT1    DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//    UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HD00180.ICDS1
//DBOUT2    DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//    UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HD00180.ICDS2
//ICEIN     DD *
  GLOBAL UNIT=SYSDA,VOLSER=DBVOL1,DBRC=N,HDPC=Y,
     DBDALLOC=N,
     ICCAT=Y
  IC DBD=HDAMDB1,ICOUT=DBOUT1
  IC DBD=HDAMDB2,ICOUT=DBOUT2
/*
```

Example 2: Creating image copies—multiple-step HASH Check in a single job

The following figure is a JCL example for DBDEFCTL allocation job.

Figure 27: Example JCL to allocate DBDEFCTL

```
//ALLOC    JOB
//ALLOC    EXEC PGM=IDCAMS,DYNAMNBR=10
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
 DELETE  (SAMPLE.DBDEFCTL) NONVSAM
 SET MAXCC = 0
 ALLOCATE DSNAME('SAMPLE.DBDEFCTL') -
          NEW                       -
          UNIT(SYSDA)               -
          VOL(HPSVOL)               -
          SPACE(10,10) CYLINDER DIR(50)
/*
```

The following figure is a JCL example for the DBD Analysis program. The HIDAM database HI00180 has three data set groups, whose DD names are DSG001, DSG002, and DSG003. IX00180 is the HIDAM primary index.

Figure 28: Example JCL for DBD Analysis program

```
//DBDANAL  JOB
//DBDANAL  EXEC FABPDA,
//              PSB='PSBL0180',
//              DBDEFC='SAMPLE.DBDEFCTL'
//PROCCTL  DD *
  PROC TYPE=ALL,HASH=YES
  DATABASE DB=HI00180,DD=DSG001
  DATABASE DB=HI00180,DD=DSG002
  DATABASE DB=HI00180,DD=DSG003
  DATABASE DB=IX00180,DD=PINDEX1,PRIMEDB=HI00180
/*
```

The following figure is a JCL example for an Image Copy job of IMS HP Image Copy with the HASH Check option enabled for a HIDAM database and the primary index. This job takes the image copies of four database data sets in a single job. The HASH records of the four database data sets are combined into one HASH record data set.

Figure 29: Example Image Copy JCL (single job)

```
//DBDUMP   JOB
//DBDUMP   EXEC FABJEIC,
//              DBDEFC='SAMPLE.DBDEFCTL',
//              SORTEX='SAMPLE.SORTEX'
//DSG001   DD DISP=OLD,DSN=HI00180.DSG001
//DSG002   DD DISP=OLD,DSN=HI00180.DSG002
//DSG003   DD DISP=OLD,DSN=HI00180.DSG003
//PINDEX1  DD DISP=OLD,DSN=IX00180.PINDEX1
//DBAOUT1  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS1
//DBAOUT2  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS2
//DBAOUT3  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS3
//DBAOUTX  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDSX
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG001   DBAOUT1          Y        DUMP SINGLE DS WITH COMP
D1 HI00180  DSG002   DBAOUT2          Y        DUMP SINGLE DS WITH COMP
D1 HI00180  DSG003   DBAOUT3          Y        DUMP SINGLE DS WITH COMP
D1 IX00180  PINDEX1  DBAOUTX          Y        DUMP SINGLE DS WITH COMP
/*
```

The following figure is a JCL example for the HASH Evaluation program for a HIDAM database and the primary index.

Figure 30: Example of HASH Evaluation program JCL

```
//HASHEVEL JOB
//*
//HASHEVAL EXEC FABPHE,
//              DBDEFC='SAMPLE.DBDEFCTL',
//              SORTEX='SAMPLE.SORTEX'
```

After you complete the HASH evaluation, delete the SORTEX data set.

Example 3: Creating image copies—multiple-step HASH Check in multiple job steps

The following figure is a JCL example for multiple Image Copy jobs with the HASH Check option enabled for a HIDAM database and the primary index used in “Example 2: Creating image copies—multiple-step HASH Check in a single job” on page 113. The same DBD Analysis program JCL can be used for this case. You can use the already created DBDEFCTL data set. The image copies of four database data sets are taken in multiple jobs. The HASH records are written into separate HASH record data sets.

Figure 31: Example of Image Copy JCL (multiple jobs)

```
//DBDUMP1  JOB
//DBDUMP   EXEC FABPIC,
//              DBDEFC='SAMPLE.DBDEFCTL',
//              SORTEX='SAMPLE.SORTEX1'
//DSG001   DD DISP=OLD,DSN=HI00180.DSG001
//DBAOUT1  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS1
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG001   DBAOUT1          Y        DUMP SINGLE DS WITH COMP
/*
//DBDUMP2  JOB
//DBDUMP   EXEC FABPIC,
//              DBDEFC='SAMPLE.DBDEFCTL',
//              SORTEX='SAMPLE.SORTEX2'
//DSG002   DD DISP=OLD,DSN=HI00180.DSG002
//DBAOUT2  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS2
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG002   DBAOUT2          Y        DUMP SINGLE DS WITH COMP
/*
```

```
//DBDUMP3  JOB
//DBDUMP   EXEC FABPIC,
//              DBDEFC='SAMPLE.DBDEFCTL',
//              SORTEX='SAMPLE.SORTEX3'
//DSG003   DD DISP=OLD,DSN=HI00180.DSG003
//DBAOUT3  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS3
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG003   DBAOUT3          Y        DUMP SINGLE DS WITH COMP
/*

//DBDUMPX  JOB
//DBDUMP   EXEC FABPIC,
//              DBDEFC='SAMPLE.DBDEFCTL',
//              SORTEX='SAMPLE.SORTEXX'
//PINDEX1  DD DISP=OLD,DSN=IX00180.PINDEX1
//DBAOUTX  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDSX
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 IX00180  PINDEX1  DBAOUTX          Y        DUMP SINGLE DS WITH COMP
/*
```

The following figure is a JCL example for the HASH Evaluation program for a HIDAM database and the primary index.

Figure 32: Example of HASH Evaluation program JCL with multiple SORTEXs

```
//HASHEVEL JOB
//*
//HASHEVAL EXEC FABPHE,
//              DBDEFC='SAMPLE.DBDEFCTL'
//HDPCPRO.SORTIN   DD DISP=SHR,DSN=DSN=SAMPLE.SORTEX1
//                 DD DISP=SHR,DSN=DSN=SAMPLE.SORTEX2
//                 DD DISP=SHR,DSN=DSN=SAMPLE.SORTEX3
//                 DD DISP=SHR,DSN=DSN=SAMPLE.SORTEXX
```

After you complete the HASH evaluation, delete all SORTEX data sets.

Examples for enabling the DEDB HASH Check option

Use the following example to enable the DEDB HASH Check option for the Image Copy function.

The following figure is a JCL example for an Image Copy job for a DEDB. The HASH Check option is enabled. This job creates image copies of four database data sets and creates a HASH evaluation report. The HASH records of four database data sets are combined into one HASH record data set.

Figure 33: Example of Image Copy JCL—DEDB HASH Check

```
//DBDUMP   JOB
//DBDUMP   EXEC FABJEIC,
//              DEFCTL='DUMMY,',
//              SORTEX='NULLFILE'
//AREA01   DD DISP=OLD,DSN=HIDEDB1.AREA01.ADS1
//AREA02   DD DISP=OLD,DSN=HIDEDB1.AREA01.ADS1
//AREA03   DD DISP=OLD,DSN=HIDEDB1.AREA01.ADS1
//AROUT1  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS1
//AROUT2  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS2
//AROUT3  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS3
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HIDEDB1  AREA01   AROUT001         Y        Y DUMP SINGLE AREA WITH COMP
D1 HIDEDB1  AREA02   AROUT002         Y        Y DUMP SINGLE AREA WITH COMP
```

```
D1 HIDEDB1  AREA03   AROUT003         Y        Y DUMP SINGLE AREA WITH COMP
/*
```

Recovering databases

The following topics explain how to recover a database data set by using the FABJMAIN program.

Topics:

- "Features for the Recovery function" on page 116
- "Considerations for the Recovery function" on page 117
- "Restrictions for the Recovery function" on page 117
- "Running the Recovery function" on page 117
- "DD statements for the Recovery function" on page 118
- "Control statement keywords for the Recovery function" on page 122
- "Examples for the Recovery function" on page 125

Features for the Recovery function

The Recovery function that is run by the FABJMAIN program supports the features summarized in the following table.

Many of the features are enabled by ICEIN control statement keywords. For a list of ICEIN control statements, see "Control statement keywords for the Recovery function" on page 122.

Table 59: Features for the Recovery function

Feature	Description
Batch image copy	An IMS image copy (batch image copy) is a copy of a database or area that reflects the state of the data at a point when no updates were being made. This feature is enabled automatically according to the format of the input data set.
Compressed image copy	A compressed image copy has the format of database records that are compressed by one of the IMS HP Image Copy compression routines. The advantage of this format is that it reduces allocation space for output image copy. This feature is enabled automatically according to the format of the input data set.
Fast Recovery image copy	A Fast Recovery image copy helps you recover database data sets quickly, reducing the total recovery time and the time that the database is unavailable. This feature is enabled automatically according to the format of the input data set.
High Performance Input/Output interface	The High Performance Input/Output (HP Input/Output or HPIO) interface reduces CPU time and usage while IMS HP Image Copy generates image copies or recovers a database.
Dynamic allocation	IMS HP Image Copy can dynamically allocate input and output data sets, such as database data sets, image copy data sets, log data sets, and change accumulation data sets. You do not need to provide a DD statement for each data set.
Full recovery	Recovers the database by using the most current image copy data sets, change accumulation data sets, and log data sets. This feature is enabled automatically if the TIMESTMP keyword is not specified.
Time stamp recovery	Recovers the database to a point in time. The time you specify must match the time stamp of the recovery point registered in DBRC.
Detect and use latest batch image copy data set	IMS HP Image Copy can detect the latest batch image copy data set that is registered to the DBRC and use it as input data set.

Feature	Description
Site Default Generation utility	The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs. For more information, see "Specifying site default values for the FABJMAIN program" on page 59.
Central management of reports	IMS HP Image Copy supports the function of the IMS Tools KB Output repository, which enables you to store the reports that are generated by IMS HP Image Copy jobs. The use of IMS Tools KB Output repository helps you simplify management of IMS HP Image Copy reports.
Offloading workload to zIIP processors	IMS HP Image Copy supports the IBM® System z® Integrated Information Processor (zIIP) to offload eligible database workloads.

Considerations for the Recovery function

Certain considerations apply to using the Recovery function with the FABJMAIN program.

To run the Recovery function in an IMS-managed ACBs environment, the following requirements must be met:

- The IMS catalog is registered to the DBRC RECON data sets.
- If IMS HP Image Copy needs to access control blocks from the IMS catalog, CATALOG=YES and ACBMGMT=CATALOG are specified in the IMS Catalog Definition exit routine (DFS3CDX0).

To recover a database data set by using an image copy data set that is created by the COPY process of Advanced Image Copy Services (Fast Recovery image copy) or by the IMS Database Image Copy 2 utility (DFSUDMT0), ensure that the allocation attributes of that database data set have not changed. The Recovery function fails if the allocation attributes are different.

When you recover a database data set from an image copy data set that is created in Fast Recovery image copy format, dynamic allocation of output database data set is done by DFSMSdss™. If you preallocated database data set manually and its attributes do not match the image copy data set in Fast Recovery image copy format, the DFSMSdss™ COPY function deletes the preallocated data set and allocates a new data set using the data set attributes of the input data set. It is not recommended to use a preallocated database data set when you recover a database from an image copy data set that is in Fast Recovery image copy format.

Restrictions for the Recovery function

Certain restrictions apply to using the Recovery function with the FABJMAIN program.

The following restrictions are common restrictions for IMS HP Image Copy functions:

- The FABJMAIN program can process only one IMS HP Image Copy function in one job-step execution.
- A HALDB requires that DBRC is active; otherwise a copy request is rejected.
- HSAM, GSAM, and MSDB databases are not supported.
- DD names that start with prefixes FABJ, ICE$, and HKT have special meaning to IMS HP Image Copy. Do not use DD statements with these prefixes except for the DD statements that are listed in "DD statements for the Recovery function" on page 118.

The following restrictions apply to using the Recovery function with the FABJMAIN program:

- The Recovery function can recover only one DBDS in one execution. The function cannot recover multiple DBDSs in one DBD.
- GROUP processing is not supported.

Running the Recovery function

You can run the Recovery function by invoking the FABJMAIN program.

Procedure

1. In FABJMAIN JCL, code the EXEC statement as follows:

```
//      EXEC PGM=FABJMAIN,REGION=nM,IMSPLEX=plex-name,DBRCGRP=dbrcgrp
```

Where:

IMSPLEX

If you need to start IMSplex through the IMS HP Image Copy job, specify the IMSPLEX parameter.

DBRCGRP

If you use the DBRCGRP keyword of IMS, you must specify the DBRCGRP parameter.

2. Code the appropriate DD statements. For a list of DD statements, see "DD statements for the Recovery function" on page 118.
   JCL examples are provided in "Examples for the Recovery function" on page 125.
3. Code the corresponding control statement in the ICEIN data set.
   To invoke the Recovery function, you must specify the RCV statement.

   For more information about ICEIN control statements, see "ICEIN control statements" on page 154. For a list of control statement keywords, see "Control statement keywords for the Recovery function" on page 122.
4. Submit the JCL.

Example

The following figure shows a sample JCL stream.

```
//* -------------------------------------------------------
//DEF#DMP EXEC PGM=IEFBR14
//RDUMPDS DD DSN=TEMPDS.RCNDUMP,
//           DISP=(,CATLG),
//           DCB=(DSORG=PS,RECFM=VB,LRECL=2048,BLKSIZE=20480),
//           SPACE=(CYL,(1,1)),UNIT=SYSDA
//* -------------------------------------------------------
//RCV     EXEC PGM=FABJMAIN,REGION=nM,COND(4,LT)
//STEPLIB   DD DISP=SHR,DSN=&HPSLIB
//          DD DISP=SHR,DSN=&IMSRES
//DFSRESLIB DD DISP=SHR,DSN=&IMSRES
//IMS       DD DISP=SHR,DSN=xxx
//IMSDALIB  DD DISP=SHR,DNS=xxxx
//RECON1    DD DISP=SHR,DSN=xxxxx
//RECON2    DD DISP=SHR,DSN=xxxxxx
//RECON3    DD DISP=SHR,DSN=xxxxxxx
//SYSPRINT  DD SYSOUT=*
//ICEPRINT  DD SYSOUT=*
//DFSPRINT  DD SYSOUT=*
//FABJRDMP  DD DISP=OLD,DSN=TEMPDS.RCNDUMP
//ICEIN     DD *
            :
```

DD statements for the Recovery function

DD statements are used to identify the source of input and the placement of output information. The following DD statements are supported for the Recovery function that is run by the FABJMAIN program.

Table 60: DD statements for the Recovery function

DDNAME	Use	Format	Required or optional
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMSDALIB	Input	PDS	Optional
RECON1 RECON2 RECON3	Input/Output	KSDS	Required if DBRC=Y (See Note 1)
IMS	Input	PDS	Required (See Note 2)

DDNAME	Use	Format	Required or optional
ICEIN	Input	LRECL=80	Required
ICEPRINT	Output	LRECL=133	Required
ICERPRT	Output	LRECL=133	Optional
SYSABEND or SYSUDUMP	Output	LRECL=133	Optional
DFSPRINT	Output	LRECL=122	Required
SYSPRINT	Output	LRECL=122	Optional
dataset	Output		Required (See Note 3)
DFSUDUMP	Input		Required (See Note 3)
DFSUCUM	Input		Required (See Note 3)
DFSULOG	Input		Required (See Note 3)
DFSVSAMP	Input	LRECL=88	Optional
DSSPRINT	Output	LRECL=133	Optional
HPSRETCD	Input	LRECL=80	Optional
FABJDRSN	Input	LRECL=80	Optional
FABJRDMP	Output	LRECL=(RECON CI size) +4, RECFM=VBA	Optional

Notes:

1. Do not specify these DD statements if you want the RECON data sets allocated dynamically.
2. IMS DD statement is not required when the IMS management ACBs is enabled.
3. IMS HP Image Copy supports dynamic allocation for these data sets. If you want these data sets allocated dynamically, do not specify these DD statements.

STEPLIB DD

This statement points to two load module library data sets. The data sets must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

where:

HPS.SHPSLMD0

The name of the library that contains the load modules of IMS HP Image Copy.

IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

To enable IMS-managed ACBs, you must include the IMS Tools Generic Exits library in the STEPLIB concatenation.

To use IMS HP Image Copy site default table, you must specify the library that contains the IMS HP Image Copy site default table.

If STEPLIB is unauthorized because it specifies libraries concatenated to IMS.SDFSRESL, you must specify a DFSRESLB DD statement.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMSDALIB DD

This statement specifies the dynamic allocation members for the database, the index, and the RECON data sets. Allocation of these data sets is attempted in the following order:

1. DD statements found in the JCL stream
2. Dynamic allocation members in the IMSDALIB concatenation
3. Dynamic allocation members in the JOBLIB or STEPLIB concatenation

For dynamic allocation of HALDB databases, RECON data sets are used instead of this DD statement.

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

IMS DD

This statement defines the library that contains the DBD describing the database to dump, generally DSNAME=IMS.DBDLIB. The data set must reside on a direct-access volume.
This statement is not required when the IMS management ACBs is enabled.

ICEIN DD

This statement is required. It specifies the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input stream (DD * or DD DATA).
For details, see "ICEIN control statements" on page 154. For a list of control statement keywords, see "Control statement keywords for the Recovery function" on page 122.

ICEPRINT DD

This statement is required. It specifies the output messages data set. The IMS HP Image Copy main module generates messages in this data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

SYSABEND DD

SYSUDUMP DD

These statements define a dump data set. If both statements are present, the last occurrence is used for the dump.

ICERPRT DD

This statement specifies the optional report data set. This data set contains the Recovery Process report. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

DFSPRINT DD

This statement specifies the required output message data set. The data set contains messages from the IMS HP Image Copy module that has alias name DFSURDB0. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

If this DD statement is not specified, IMS HP Image Copy ends abnormally with U3905.

SYSPRINT DD

If you need to review complete messages from the DBRC modules, write the messages in a permanent data set by specifying so on the DD statement, or route the messages through the output stream (SYSOUT).

***dataset* DD**

This statement defines the data set to be recovered. The ddname must be the same as the one in the DBD that describes this data set. It must also be in the utility control statement.
For DEDBs, this DD statement defines the area data set of the area to be recovered. The ddname must be the same as the one in the DBD that describes this area. If an area is registered to the DBRC RECON data set, the ddname and dsname must match the names registered to the ADS list of the target area. If an area is not registered to the DBRC RECON data set and this data set contains the NOFORCER attribute, the ddname must be the same as the area name and must be present in the utility control statement.

To have the Recovery function dynamically allocate the output data set, omit this DD statement and specify the DBDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

DFSUDUMP DD

This statement defines the input image copy data set, if any, to be used for recovery. It can be a data set created by either the Image Copy function of IMS HP Image Copy or the original Image Copy utility. (The original Image Copy utility can be the Batch Database Image Copy utility, the Online Database Image Copy utility, or the HISAM Reorganization Unload utility.)
To have the Recovery function dynamically allocate the input image copy data set, omit this DD statement and specify the DSDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

Notes:

- If you specify TIMESTMP=LASTIC or TIMESTMP=LASTICALL, you must allocate the input image copy data set with dynamic allocation. This statement must not be coded in JCL.
- If you specify TIMESTMP=*timestamp*, use dynamic allocation for the image copy data set. If the image copy data set specified is not the one registered to DBRC, the Recovery function fails.

DFSUCUM DD

This statement defines the accumulated change input data set. If no accumulated change input is supplied, this statement must be coded as DD DUMMY. This data set can reside on a tape or a direct-access volume.
To have the Recovery function dynamically allocate the input data set, omit this DD statement and specify the DSDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

If you specify TIMESTMP=*timestamp*, use dynamic allocation for the accumulated change input data set. If the accumulated change data set specified is not the one registered to DBRC, the Recovery function fails.

DFSULOG DD

This statement defines the log change input. If there are no log changes, this statement must be coded as DD DUMMY. This data set can reside on a tape or a direct-access volume.
To have the Recovery function dynamically allocate the data set, omit this DD statement and specify the DSDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

If you specify TIMESTMP=*timestamp*, use dynamic allocation for the log change input data set. If the log change data set specified is not the one registered to DBRC, the Recovery function fails.

You can use multiple logs as input by concatenating the data sets.

The DD statements must be in the date and time sequence. DBRC verifies that the log data sets are in chronological order according to their STOP TIME.

DFSVSAMP DD

This statement describes the data set that contains the buffer information required by the DL/I buffer handler. This DD statement is required:

- If only change accumulation input is used.
- If log input is used.
- For recovering a VSAM ESDS with data from HISAM unload for the input.
- For recovery when a null image copy data set is used for input.

For more information about the control statement format and the buffer pool structure, see *IMS System Definition*.

The data set can reside on a tape or a direct-access device, or it can be routed through the input stream (DD * or DD DATA).

DSSPRINT DD

This statement specifies the output messages data set for the messages that DFSMSdss™ generates when the Advanced Image Copy Services is used. If this statement is present, DFSMSdss™ issues messages that are prefixed with ADR to the data set. These messages provide processing information and any errors that occurred during processing.

HPSRETCD DD

This statement is a function-unique DD statement for the Return Code Handling option. This optional input data set contains the user-specified control statements that define the return codes of the IMS HP Image Copy process.

For details, see "HPSRETCD control statement" on page 270.

FABJDRSN DD

This statement specifies the input data set that contains the user-specified control statements for defining the error reason code (S99ERROR) and the SMS reason code (S99ERSN) for dynamic allocation.

For details, see "FABJDRSN control statement" on page 272.

FABJRDMP DD

This statement specifies the output data set for storing the RECON REPRO output (in QSAM format) for diagnosis use. IMS HP Image Copy runs REPRO and stores the RECON data set into the data set that this DD points to, if the DD is defined and the following conditions are met:

- DBDS record is found in RECON, but its corresponding database record is not found by the Image Copy function or the Recovery function.
- IC record is found in RECON, but its corresponding DBDS record is not found by the Recovery function.

Tape drives are not supported.

This DD is optional.

The specification is as follows:

```
//FABJRDMP DD  DISP=OLD,DSN=dataset_name
```

where *dataset_name* is the data set name where REPRO output is stored.

Control statement keywords for the Recovery function

The following tables summarize the keywords that are supported for the Image Copy function.

Subsections:

- "Keywords for time stamp recovery and detecting the latest batch image copy data sets" on page 122
- "Keywords for process control" on page 122
- "Keywords for specifying input data sets" on page 123
- "Keywords for dynamically allocating input data sets" on page 123
- "Keywords for Advanced Image Copy Services" on page 124
- "Keywords for DBRC processing" on page 124
- "Keywords for storing reports in the IMS Tools KB repository" on page 124
- "Keywords for buffer tuning" on page 124
- "Keywords for error handling" on page 124

Keywords for time stamp recovery and detecting the latest batch image copy data sets

The following table summarizes the keywords for time stamp recovery and detecting the latest batch image copy data sets.

Table 61: Keywords for time stamp recovery and detecting the latest batch image copy data sets

Keyword	Statement	Description	Topic
TIMECHK	GLOBAL, RCV	The TIMECHK keyword specifies whether to verify the time stamp in the image copy header record with the DBRC record.	"TIMECHK keyword" on page 249
TIMESTMP	GLOBAL, RCV	The TIMESTMP keyword specifies the time stamp to identify the input image copy data sets. This keyword also specifies whether to detect and use the latest batch image copy.	"TIMESTMP keyword" on page 250

Keywords for process control

The following table summarizes the keywords for process control.

Table 62: Keywords for process control			
Keyword	**Statement**	**Description**	**Topic**
GSGNAME	GLOBAL	The GSGNAME keyword specifies the global service group (GSG) name for Remote Site Recovery (RSR).	“GSGNAME keyword” on page 195
HPIO	GLOBAL, RCV	The HPIO keyword specifies whether to use the HP Input/Output interface.	“HPIO keyword” on page 199
ZIIPMODE	GLOBAL	The ZIIPMODE keyword specifies whether IMS HP Image Copy offloads eligible database workloads to zIIP processors.	“ZIIPMODE keyword” on page 269

Keywords for specifying input data sets

The following table summarizes the keywords for specifying input data sets.

Table 63: Keywords for specifying input data sets			
Keyword	**Statement**	**Description**	**Topic**
ADDN	RCV	The ADDN keyword specifies the area data set DD name in the ADS list that is registered to the DBRC RECON data set.	“ADDN keyword” on page 162
AREA	RCV	The AREA keyword specifies the names of areas in the database to be processed. The AREA keyword is applicable only to DEDBs.	“AREA keyword” on page 163
DBD	RCV	The DBD keyword specifies the name of the DBD to be processed.	“DBD keyword” on page 175
DDN	RCV	The DDN keyword specifies the database data set (DBDS) DD name. This keyword is applicable only to full-function databases.	“DDN keyword” on page 178
ICDUMP	RCV	The ICDUMP keyword specifies the DD name of the input image copy data set.	“ICDUMP keyword” on page 202
LOGUSE	GLOBAL, RCV	The LOGUSE keyword specifies to use the update log that is registered to DBRC for recovery.	“LOGUSE keyword” on page 216
PART	RCV	The PART keyword specifies the name of the partition to process.	“PART keyword” on page 224

Keywords for dynamically allocating input data sets

The following table summarizes the keywords for dynamically allocating input data sets.

Table 64: Keywords for dynamically allocating input data sets			
Keyword	**Statement**	**Description**	**Topic**
CAUNIT	GLOBAL, RCV	The CAUNIT keyword specifies the unit name where the input change accumulation data set resides.	“CAUNIT keyword” on page 165
DBDALLOC	GLOBAL, RCV	The DBDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates data sets of DL/I database, HALDB, or DEDB areas.	“DBDALLOC keyword” on page 176
DSDALLOC	GLOBAL, RCV	The DSDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates the input data set.	“DSDALLOC keyword” on page 182
ICUNIT	GLOBAL, RCV	The ICUNIT keyword specifies the name of the unit on which the input image copy data set resides.	“ICUNIT keyword” on page 209

Keyword	Statement	Description	Topic
IGNORCAT	GLOBAL	The IGNORCAT keyword specifies whether IMS HP Image Copy uses the catalog information when it dynamically allocates input data sets.	“IGNORCAT keyword” on page 211
LOGUNIT	GLOBAL, RCV	The LOGUNIT keyword specifies the name of the unit on which the input log data set resides.	“LOGUNIT keyword” on page 215

Keywords for Advanced Image Copy Services

The following table summarizes the keywords that are related to Advanced Image Copy Services.

Table 65: Keywords for Advanced Image Copy Services

Keyword	Statement	Description	Topic
DATA_MOVER	GLOBAL	The DATA_MOVER keyword defines the data mover utility for Advanced Image Copy Services.	“DATA_MOVER keyword” on page 173

Keywords for DBRC processing

The following table summarizes the keywords that are related to DBRC processing.

Table 66: Keywords for DBRC processing

Keyword	Statement	Description	Topic
DBRC	GLOBAL	The DBRC keyword specifies to override the specification of DBRC in the IMSCTRL macro statement that is specified during IMS system definition.	“DBRC keyword” on page 178

Keywords for storing reports in the IMS Tools KB repository

The following table summarizes the keywords for enabling the IMS Tools KB repository for storing reports.

Table 67: Keywords for storing reports in the IMS Tools KB repository

Keyword	Statement	Description	
ITKBLOAD	GLOBAL	The ITKBLOAD keyword specifies the IMS Tools KB load module data set.	“ITKBLOAD keyword” on page 212
ITKBSRVR	GLOBAL	The ITKBSRVR keyword specifies the name of the IMS Tools KB server XCF group.	“ITKBSRVR keyword” on page 213

Keywords for buffer tuning

The following table summarizes the keywords for buffer tuning. Also see “Performance tips for IMS HP Image Copy” on page 385 to tune the buffers to achieve optimal performance.

Table 68: Keywords for buffer tuning

Keyword	Statement	Description	Topic
DBBUF	GLOBAL, RCV	The DBBUF keyword specifies the number of buffers to be used to access the database data set groups or areas.	“DBBUF keyword” on page 175
DSBUF	GLOBAL, RCV	The DSBUF keyword specifies the number of buffers to be used to access the input data set.	“DSBUF keyword” on page 181

Keywords for error handling

The following table summarizes the keywords for error handling.

Table 69: Keywords for error handling			
Keyword	**Statement**	**Description**	**Topic**
DRSNDSN	GLOBAL	The DRSNDSN keyword specifies the name of the data set that contains FABJDRSN control statements, which define the error reason codes and SMS reason codes of dynamic allocation.	“DRSNDSN keyword” on page 181
EXTENT	GLOBAL, RCV	The EXTENT keyword specifies the maximum number for OSAM data set extents. This number is used to check the extent number of the OSAM data set after the data set is recovered.	“EXTENT keyword” on page 189
RETCDDSN	GLOBAL	The RETCDDSN keyword specifies the name of the data set that contains HPSRETCD control statements, which define the return codes of IMS HP Image Copy processes.	“RETCDDSN keyword” on page 228

Examples for the Recovery function

The following topics provide examples for using the Recovery function with the FABJMAIN program.

To use DBRC without dynamically allocating the RECON data sets, you must add the DD statements for the DBRC RECON data sets, as shown in the following figure:

Figure 34: Sample DD statements for DBRC RECON data sets

```
//RECON1   DD  DSNAME=RECON1,DISP=SHR
//RECON2   DD  DSNAME=RECON2,DISP=SHR
//RECON3   DD  DSNAME=RECON3,DISP=SHR
```

Example for enabling dynamic allocation

Use this example to enable dynamic allocation for the Recovery function.

Recovering a database from image copy—dynamic allocation enabled

The following JCL example is for invoking FABJMAIN to run the Recovery function. In this example, dynamic allocation is enabled:

Figure 35: JCL example for recovering a database—dynamic allocation enabled

```
//EXAMPLE5 JOB
//         EXEC PGM=FABJMAIN
//STEPLIB  DD DISP=SHR,DSN=HPS.SHPSLMD0
//         DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//IMSDALIB DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//DFSPRINT DD SYSOUT=*
//ICEPRINT DD SYSOUT=*
//ICEIN    DD *
  RCV    DBD=HDAMDB01,DDN=HDAMDD01
/*
```

The data set DDN=HDAMDD01 of the output database (DBD=HDAMDB01) is dynamically allocated by the Recovery function using DFSMDA members.

The input image copy data set, the log data set, and the change accumulation data set are also dynamically allocated by the Recovery function. The name of each input data set is read from the RECON data set.

Creating new image copies from an image copy

The following topics explain how to create new image copy data sets from an image copy data set by using the FABJMAIN program.

Topics:

- "Features for the Create Image Copy function" on page 126
- "Considerations for the Create Image Copy function" on page 127
- "Restrictions for the Create Image Copy function" on page 129
- "Running the Create Image Copy function" on page 130
- "DD statements for the Create Image Copy function" on page 131
- "Control statement keywords for the Create Image Copy function" on page 134
- "Examples for the Create Image Copy function" on page 140

Features for the Create Image Copy function

The Create Image Copy function supports the features summarized in the following table.

Many of the features are enabled by ICEIN control statement keywords. For a list of ICEIN control statements, see "Control statement keywords for the Create Image Copy function" on page 134.

Table 70: Features for the Create Image Copy function

Feature	Description
Batch image copy	An IMS image copy (batch image copy) is a copy of a database or area that reflects the state of the data at a point when no updates were being made.
Compressed image copy	A compressed image copy has the format of database records that are compressed by one of the IMS HP Image Copy compression routines. The advantage of this format is that it reduces allocation space for output image copy.
Fast Recovery image copy	A Fast Recovery image copy helps you recover database data sets quickly, reducing the total recovery time and the time that the database is unavailable. This feature is enabled automatically according to the format of the input data set.
Database group processing	In database group processing, all database data groups and areas that are registered to a change accumulation (CA) group or a database data set (DBDS) group in DBRC are processed. For more information, see "GROUP statement" on page 155.
Dynamic allocation	IMS HP Image Copy can dynamically allocate input and output data sets, such as database data sets, image copy data sets, log data sets, and change accumulation data sets. You do not need to provide a DD statement for each data set.
Stacking output image copies	Places two or more image copy data sets on the same tape or on a set of tapes (stacking) to increase the tape media efficiency.
Detecting latest batch image copy data set	IMS HP Image Copy can detect the latest batch image copy data set that is registered to the DBRC and use it as input data set.
Creating physical copy and logical copy	The function supports two process types for creating image copies; physical copy and logical copy.
NOTIFY.IC/CHANGE.IC for missing IC record	The function can issue the NOTIFY.IC or the CHANGE.IC command to register the output data set to RECON.
Creating seven image copies at one time	The function can create up to seven copies of the input data set in one run.
Site Default Generation utility	The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs. For more information, see "Specifying site default values for the FABJMAIN program" on page 59.
Central management of reports	IMS HP Image Copy supports the function of the IMS Tools KB Output repository, which enables you to store the reports that are generated by IMS HP Image Copy jobs. The use of IMS Tools KB Output repository helps you simplify management of IMS HP Image Copy reports.

Feature	Description
Offloading workload to zIIP processors	IMS HP Image Copy supports the IBM® System z® Integrated Information Processor (zIIP) to offload eligible database workloads.

Considerations for the Create Image Copy function

Certain considerations apply to using the Create Image Copy function.

Considerations for dynamically allocating output image copy data sets

If generation data group (GDG) is enabled, the oldest generation data set is deleted when the maximum number of generation data sets is reached. This is true even when the Create Image Copy function fails to create image copies successfully. For more information, see "Attention: Oldest GDG data set might be deleted" on page 276.

Logical copy and physical copy

The Create Image Copy function supports two process types; physical copy and logical copy.

Physical copy creates new data sets without changing the compression routine of the input image copy data set.

Logical copy can create a data set copy that has a compression algorithm different from the input data set. Logical copy is useful for comparing the compression ratio of two compression routines.

To create a logical copy of an image copy data set, specify CRCTYPE=L and COMP keyword in the ICEIN GLOBAL, GROUP, or CRC statement.

The Create Image Copy function automatically interprets the compression routine of input image copy data set. It expands the data, and then re-compresses it by the compression routine specified by the ICEIN CMPRTN keyword. Also it can be used to create a compressed image copy data set from a non-compressed image copy, or to create a non-compressed image copy data set from a compressed image copy.

The result of combining the input data set, COMP keyword, and the COMPRTN keyword is discussed in the following topics.

Subtopics:

- "Restrictions for creating logical copy" on page 127
- "Process type" on page 127

Restrictions for creating logical copy

If one of the following conditions is met, the Create Image Copy function ignores CRCTYPE=L and applies physical copy:

- The input image copy data set is created by the IMS Online Image Copy utility or the IMS IC2 utility.
- The compression routine that was applied to the original image copy data set and the compression routine specified for the COMPRTN keyword are the same.
- COMP=N is specified for the original image copy data set and it is not compressed.

CRCTYPE=L, which specifies to create a logical copy of the input image copy data set, is not supported if both of the following conditions are met:

- The input image copy data set is created by the COPY process of Advanced Image Copy Services or the IMS Database Image Copy 2 utility (DFSUDMT0).
- The original database data set is an encrypted database or is allocated as an extended format data set.

When creating more than one output data set from an original image copy data set, you cannot use different compression routines for each output data set.

Process type

When CRCTYPE=L is specified in the ICEIN control statement, the process type and the compressed format of the output data set are determined by the combination of the original image copy data set, the COMP keyword, and the COMPRTN keyword.

The following table shows the relationship between the compression type of image copy data set and output data set.

Table 71: Compression type and the output data set

Input image copy data set format	COMP=	COMPRTN=	Output image copy data set	
			Type processed	Format
Not compressed	-	-	Physical copy	Not compressed
	N	-	Physical copy	Not compressed
	Y	-	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP1	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP2	Logical copy	Compressed by FABJCMP2
	Y	FABJCMP3	Logical copy	Compressed by FABJCMP3
	Y	FABJCMP4	Logical copy	Compressed by FABJCMP4
Compressed by FABJCMP1	-	-	Physical copy	Compressed by FABJCMP1
	N	-	Logical copy	Not compressed
	Y	-	Physical copy	Compressed by FABJCMP1
	Y	FABJCMP1	Physical copy	Compressed by FABJCMP1
	Y	FABJCMP2	Logical copy	Compressed by FABJCMP2
	Y	FABJCMP3	Logical copy	Compressed by FABJCMP3
	Y	FABJCMP4	Logical copy	Compressed by FABJCMP4
Compressed by FABJCMP2	-	-	Physical copy	Compressed by FABJCMP2
	N	-	Logical copy	Not compressed
	Y	-	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP1	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP2	Physical copy	Compressed by FABJCMP2
	Y	FABJCMP3	Logical copy	Compressed by FABJCMP3
	Y	FABJCMP4	Logical copy	Compressed by FABJCMP4
Compressed by FABJCMP3	-	-	Physical copy	Compressed by FABJCMP3
	N	-	Logical copy	Not compressed
	Y	-	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP1	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP2	Logical copy	Compressed by FABJCMP2
	Y	FABJCMP3	Physical copy	Compressed by FABJCMP3
	Y	FABJCMP4	Logical copy	Compressed by FABJCMP4
Compressed by FABJCMP4	-	-	Physical copy	Compressed by FABJCMP4
	N	-	Logical copy	Not compressed
	Y	-	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP1	Logical copy	Compressed by FABJCMP1
	Y	FABJCMP2	Logical copy	Compressed by FABJCMP2
	Y	FABJCMP3	Logical copy	Compressed by FABJCMP3
	Y	FABJCMP4	Physical copy	Compressed by FABJCMP4

DBRC IC record registration

The Create Image Copy function issues the NOTIFY.IC or the CHANGE.IC command under certain conditions. These commands register the primary output image copy data set to RECON.

Subtopics:

- "NOTIFY.IC command and CHANGE.IC command" on page 129
- "NOTIFY.IC restrictions" on page 129

NOTIFY.IC command and CHANGE.IC command

The NOTIFY.IC or the CHANGE.IC command for the primary output data set is issued when both NOTIFY=Y and DBRC=Y are specified in the ICEIN control statement. These commands register the primary output image copy data set to RECON when one of the following conditions is met:

- If only the primary image copy data set is registered to RECON as an available IC record, the Create Image Copy function issues the CHANGE.IC command for the primary output data set and registers it to RECON as the secondary image copy data set.
- If either the primary image copy data set or the secondary image copy data set is flagged as an error in RECON, the Create Image Copy function issues the CHANGE.IC command for the primary output data set and registers it to RECON rather than to the error IC record.
- If an image copy data set that has the same runtime and the same type of input image copy data set is not registered to RECON, the Create Image Copy function issues the NOTIFY.IC command for the input image copy data set and the primary output image copy data set to:
  - Register the input image copy data set as the primary image copy data set.
  - Register the primary output data set to RECON as the secondary image copy data set.

The NOTIFY.IC command is supported only for batch image copy.

If both the primary and the image copy data sets are normally registered in RECON, the CHANGE.IC command is not issued.

The Create Image Copy function issues the CHANGE.IC command for the target IC record in RECON. It is strongly recommended that ICEDLIST DD is specified in runtime JCL and you take the DBRC command report.

NOTIFY.IC restrictions

If any of the following conditions is met, the Create Image Copy function ignores NOTIFY=Y:

- Both the primary and the secondary image copy data sets are registered normally to RECON.
- Neither the primary nor the secondary image copy data set is registered to RECON and the type of the input image copy data set is one of the following:
  - Concurrent image copy
  - Fast Recovery image copy
  - IC2 image copy
  - Online image copy
- Both the primary and the secondary image copy data sets are flagged as an error in RECON and the input image copy data set is not specified in the JCL.
- The type of the input image copy data set is one of the following, and the input data set is not dynamically allocated:
  - Online image copy
  - IC2 image copy
  - Concurrent image copy

Restrictions for the Create Image Copy function

Certain restrictions apply to using the Create Image Copy function.

The following restrictions are common restrictions for IMS HP Image Copy functions:

- The FABJMAIN program can process only one IMS HP Image Copy function in one job-step execution.
- A HALDB requires that DBRC is active; otherwise a copy request is rejected.
- HSAM, GSAM, and MSDB databases are not supported.
- DD names that start with prefixes FABJ, ICE$, and HKT have special meaning to IMS HP Image Copy. Do not use DD statements with these prefixes except for the DD statements that are listed in "DD statements for the Create Image Copy function" on page 131.

The following restrictions apply to the Create Image Copy function:

- Logical copy does not support input image copy data sets that are generated by the following utilities:
  - IMS Online Image Copy utility
  - IMS Image Copy 2 utility
  - IMS HISAM Reorganization Unload utility
- If the input image copy data set is generated by one of the following utilities, the DBRC must active:
  - IMS Online Image Copy utility
  - IMS Image Copy 2 utility
- The maximum number of full-function database data sets that can be processed in a job step is 2000.
- The maximum number of DEDB area data sets that can be processed in a job step is 2048.
- The total number of database data sets that can be processed in a job step is equal to or fewer than 2048.

Running the Create Image Copy function

You can run the Create Image Copy function by invoking the FABJMAIN program.

Procedure

1. In FABJMAIN JCL, code the EXEC statement as follows:

   ```
   //      EXEC PGM=FABJMAIN,REGION=nM,IMSPLEX=plex-name,DBRCGRP=dbrcgrp
   ```

   Where:

   IMSPLEX

   If you need to start IMSplex through the IMS HP Image Copy job, specify the IMSPLEX parameter.

   DBRCGRP

   If you use the DBRCGRP keyword of IMS, you must specify the DBRCGRP parameter.
2. Code the appropriate DD statements. For a list of DD statements, see "DD statements for the Create Image Copy function" on page 131.
   JCL examples are provided in "Examples for the Create Image Copy function" on page 140.
3. Code the corresponding control statement in the ICEIN data set.
   To invoke the Image Copy function, you must specify the CRC statement.

   For ICEIN control statements, see "ICEIN control statements" on page 154. For a list of control statement keywords, see "Control statement keywords for the Create Image Copy function" on page 134.
4. Submit the JCL.

Example

The following figure shows a sample JCL stream.

```
//CRCOPY  EXEC PGM=FABJMAIN,REGION=nM
//STEPLIB  DD  DISP=SHR,DSN=&HPSLIB
//         DD  DISP=SHR,DSN=&IMSRES
```

```
//DFSRESLB DD  DISP=SHR,DSN=&IMSRES
//IMS      DD  DISP=SHR,DSN=&DBDLIB
//IMSDALIB DD  DISP=SHR,DSN=&MDALIB
//SYSPRINT DD  SYSOUT=*
//ICEPRINT DD  SYSOUT=*
//DFSPRINT DD  SYSOUT=*
//ICERPRT  DD  SYSOUT=*
//FABJSTAT DD  SYSOUT=*
//ICEIN    DD  *
  GLOBAL    CRCTYPE=P,
            DBRC=Y,
            NOTIFY=Y,
            DSN=&ICHLQ..&DBD..&DDN..CRC1,
            DSN2=&ICHLQ..&DBD..&DDN..CRC2,
            ICHLQ=TEMPDS.RGV11040,
            ICOUT=(*,*),
            SPACE=(TRK,20,1,RLSE)
*
* HDAM
*
  CRC      DBD=DBHDAM50,DDN=HDAMDD51
  CRC      DBD=DBHDAM50,DDN=HDAMDD52
/*
```

DD statements for the Create Image Copy function

DD statements are used to identify the source of input and the placement of output information. The following DD statements are supported for the Create Image Copy function.

Table 72: DD statements for the Create Image Copy

DDNAME	Use	Format	Required or optional
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMSDALIB	Input	PDS	Optional
RECON1 RECON2 RECON3	Input/Output	KSDS	Required if DBRC=Y (See Note 1)
IMS	Input	PDS	Required
ICEIN	Input	LRECL=80	Required
ICEPRINT	Output	LRECL=133	Required
SYSABEND or SYSUDUMP	Output	LRECL=133	Optional
ICERPRT	Output	LRECL=133	Optional
ICEDLIST	Output	LRECL=133	Optional
ic-ddname	Input		Optional (See Note 2)
dataout1	Output	RECFM=FB, VBS, or U	Required (See Note 2)
dataout2-dataout7	Output	RECFM=FB, VBS, or U	Optional (See Note 2)
stack1	Output	RECFM=FB, VBS, or U	Required (See Note 2)
stack1-7	Output	RECFM=FB, VBS, or U	Optional (See Note 2)
DSSPRINT	Output	LRECL=133	Optional
HPSRETCD	Input	LRECL=80	Optional
FABJDRSN	Input	LRECL=80	Optional

DDNAME	Use	Format	Required or optional

Notes:

1. Do not specify these DD statements if you want the RECON data sets allocated dynamically.
2. IMS HP Image Copy supports dynamic allocation for these data sets. If you want these data sets allocated dynamically, do not specify these DD statements.

STEPLIB DD

This statement points to two load module library data sets. The data sets must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

where:

HPS.SHPSLMD0

The name of the library that contains the load modules of IMS HP Image Copy.

IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

To use IMS HP Image Copy site default table, you must specify the library that contains the IMS HP Image Copy site default table.

If STEPLIB is unauthorized because it specifies libraries concatenated to IMS.SDFSRESL, you must specify a DFSRESLB DD statement.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMSDALIB DD

This statement specifies the dynamic allocation members for the database, the index, and the RECON data sets. Allocation of these data sets is attempted in the following order:

1. DD statements found in the JCL stream
2. Dynamic allocation members in the IMSDALIB concatenation
3. Dynamic allocation members in the JOBLIB or STEPLIB concatenation

For dynamic allocation of HALDB databases, RECON data sets are used instead of this DD statement.

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

IMS DD

This statement defines the library that contains the DBD describing the database to dump, generally DSNAME=IMS.DBDLIB. The data set must reside on a direct-access volume.

ICEIN DD

This statement is required. It specifies the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input stream (DD * or DD DATA).
For details, see “ICEIN control statements” on page 154. For a list of control statement keywords, see “Control statement keywords for the Create Image Copy function” on page 134.

ICEPRINT DD

This statement is required. It specifies the output messages data set. The IMS HP Image Copy main module generates messages in this data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

SYSABEND DD

SYSUDUMP DD

These statements define a dump data set. If both statements are present, the last occurrence is used for the dump.

ICERPRT DD

This statement specifies the optional report data set. This data set contains the Create Image Copy report. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

ICEDLIST DD

This statement specifies the output messages data set. The DBRC report for DBRC commands, such as the NOTIFY.IC, the NOTIFY.UIC, and the CHANGE.IC commands, is generated in this data set. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

***ic-ddname* DD**

This statement defines the input image copy data set to be used for creating a new image copy data set. It can be a data set created by either the Image Copy function of IMS HP Image Copy or the original Image Copy utility. (The original Image Copy utility can be the Batch Database Image Copy utility, the Online Database Image Copy utility, the Image Copy 2 utility, or the HISAM Reorganization Unload utility.)
To have the Create Image Copy function allocate the input data set dynamically, omit this DD statement and specify the DSDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

***dataout1* DD or *stack1* DD**

This statement defines the first copy of the dumped output data set.

One DD statement is required for each data set to be dumped. The ddname can be any 1- to 8-character string, but the ddname must appear in the associated utility control statement. The output device must be either a direct-access volume or a tape.

Standard labels must be used. If the track size of the output direct-access device exceeds 32 KB, and no DCB is explicitly specified, the BLKSIZE of the block in which multiple blocks can reside on a track is used as the default value, unless the database record is larger than the capacity of a half track. If BLKSIZE is specified in the JCL, that BLKSIZE is used.

To have the Create Image Copy function allocate the output data set dynamically, omit this DD statement and specify the ICDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

For details, see "ICOUT keyword" on page 207 and "STACK keyword" on page 241.

***dataout2* DD or *stack2* DD**

***dataout3* DD or *stack3* DD**

***dataout4* DD or *stack4* DD**

***dataout5* DD or *stack5* DD**

***dataout6* DD or *stack6* DD**

***dataout7* DD or *stack7* DD**

This statement is required only if the associated utility control statement requests that more than two copies of the dump be created. The name must appear in the control statement, and must be that of either the tape or the direct-access device. Standard labels must be used. If the track size of the output direct-access device exceeds 32 KB and no DCB is explicitly specified, the BLKSIZE of the block in which multiple blocks can reside in a track is used as the default value, unless the database record is larger than the capacity of a half track. If BLKSIZE is specified in the JCL, that BLKSIZE is used.
Once the utility has proceeded beyond the first PUT, all I/O errors caused by either output data set result in RC=08. The Create Image Copy function does not continue to process the subsequent output data sets.

To have the Create Image Copy function allocate the output data set dynamically, omit this DD statement and specify the ICDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

DSSPRINT DD

This statement specifies the output messages data set for the messages that DFSMSdss™ generates when the Advanced Image Copy Services is used. If this statement is present, DFSMSdss™ issues messages that are prefixed with ADR to the data set. These messages provide processing information and any errors that occurred during processing.

HPSRETCD DD

This statement is a function-unique DD statement for the Return Code Handling option. This optional input data set contains the user-specified control statements that define the return codes of the IMS HP Image Copy process.

For details, see "HPSRETCD control statement" on page 270.

FABJDRSN DD

This statement specifies the input data set that contains the user-specified control statements for defining the error reason code (S99ERROR) and the SMS reason code (S99ERSN) for dynamic allocation.

For details, see "FABJDRSN control statement" on page 272.

Control statement keywords for the Create Image Copy function

The following tables summarize the keywords that are supported for the Image Copy function.

Subsections:

- "Keywords for process control" on page 134
- "Keywords for specifying input data sets" on page 134
- "Keywords for dynamically allocating input data sets" on page 135
- "Keywords for dynamically allocating output image copy data sets" on page 135
- "Keywords for naming output image copy data sets" on page 136
- "Keywords for defining attributes of image copy data sets" on page 137
- "Keywords for data set stacking" on page 137
- "Keywords for Advanced Image Copy Services" on page 138
- "Keywords for DBRC processing" on page 138
- "Keywords for creating compressed image copies" on page 138
- "Keywords for group processing" on page 138
- "Keywords for storing reports in the IMS Tools KB repository" on page 139
- "Keywords for buffer tuning" on page 139
- "Keywords for error handling" on page 139

Keywords for process control

The following table summarizes the keywords for process control.

Table 73: Keywords for process control

Keyword	Statement	Description	Topic
CRCTYPE	GLOBAL, GROUP, CRC	The CRCTYPE keyword specifies whether the Create Image Copy function creates a physical copy or a logical copy of each input data set.	"CRCTYPE keyword" on page 170
HPIO	GLOBAL, GROUP, CRC	The HPIO keyword specifies whether to use the HP Input/Output interface.	"HPIO keyword" on page 199

Keywords for specifying input data sets

The following table summarizes the keywords for specifying input data sets.

Table 74: Keywords for specifying input data sets

Keyword	Statement	Description	Topic
AREA	CRC	The AREA keyword specifies the names of areas in the database to be processed. The AREA keyword is applicable only to DEDBs.	"AREA keyword" on page 163
DBD	CRC	The DBD keyword specifies the name of the DBD to be processed.	"DBD keyword" on page 175

Keyword	Statement	Description	Topic
DDN	CRC	The DDN keyword specifies the database data set (DBDS) DD name. This keyword is applicable only to full-function databases.	"DDN keyword" on page 178
ICDUMP	CRC	The ICDUMP keyword specifies the DD name of the input image copy data set.	"ICDUMP keyword" on page 202
PART	CRC	The PART keyword specifies the name of the partition to process.	"PART keyword" on page 224
TIMESTMP	GLOBAL, CRC	The TIMESTMP keyword specifies the time stamp to identify the input image copy data sets. This keyword also specifies whether to detect and use the latest batch image copy.	"TIMESTMP keyword" on page 250

Keywords for dynamically allocating input data sets

The following table summarizes the keywords for dynamically allocating input data sets.

Table 75: Keywords for dynamically allocating input data sets

Keyword	Statement	Description	Topic
DSDALLOC	GLOBAL, CRC	The DSDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates the input data set.	"DSDALLOC keyword" on page 182
ICUNIT	GLOBAL, GROUP, CRC	The ICUNIT keyword specifies the name of the unit on which the input image copy data set resides.	"ICUNIT keyword" on page 209
IGNORCAT	GLOBAL	The IGNORCAT keyword specifies whether IMS HP Image Copy uses the catalog information when it dynamically allocates input data sets.	"IGNORCAT keyword" on page 211

Keywords for dynamically allocating output image copy data sets

The following table summarizes the keywords for dynamically allocating output image copy data sets.

Table 76: Keywords for dynamically allocating output image copy data sets

Keyword	Statement	Description	Topic
DATACLAS	GLOBAL, GROUP, CRC	The DATACLAS keyword specifies the name of the data class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.	"DATACLAS keyword" on page 171
DATACLAS2	GLOBAL, GROUP, CRC	The DATACLAS2 keyword specifies the name of the data class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.	"DATACLAS2 keyword" on page 171
DATACLAS*n*	GLOBAL, GROUP, CRC	The DATACLAS*n* keyword specifies the name of the data class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.	"DATACLASn keyword" on page 172
ICDALLOC	GLOBAL, GROUP, CRC	The ICDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates output image copy data set if relevant DD statements are not supplied in the JCL.	"ICDALLOC keyword" on page 201
MGMTCLAS	GLOBAL, GROUP, CRC	The MGMTCLAS keyword specifies the name of the management class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.	"MGMTCLAS keyword" on page 217

Keyword	Statement	Description	Topic
MGMTCLAS2	GLOBAL, GROUP, CRC	The MGMTCLAS2 keyword specifies the name of the management class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.	"MGMTCLAS2 keyword" on page 217
MGMTCLAS*n*	GLOBAL, GROUP, CRC	The MGMTCLAS*n* keyword specifies the name of the management class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.	"MGMTCLASn keyword" on page 218
SPACE	GLOBAL, GROUP, CRC	The SPACE keyword specifies the space parameter for the output image copy data set for dynamic allocation.	"SPACE keyword" on page 239
STORCLAS	GLOBAL, GROUP, CRC	The STORCLAS keyword specifies the name of the storage class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.	"STORCLAS keyword" on page 244
STORCLAS2	GLOBAL, GROUP, CRC	The STORCLAS2 keyword specifies the name of the storage class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.	"STORCLAS2 keyword" on page 244
STORCLAS*n*	GLOBAL, GROUP, CRC	The STORCLAS*n* keyword specifies the name of the storage class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.	"STORCLASn keyword" on page 245
UNIT	GLOBAL, GROUP, CRC	The UNIT keyword specifies the UNIT parameter for the allocation of the output image copy data set.	"UNIT keyword" on page 261
UNIT2	GLOBAL, GROUP, CRC	The UNIT2 keyword specifies the UNIT parameter for allocation of the secondary output image copy data set.	"UNIT2 keyword" on page 261

Keywords for naming output image copy data sets

The following table summarizes the keywords for naming output image copy data sets.

Table 77: Keywords for naming output image copy data sets

Keyword	Statement	Description	Topic
DSN	GLOBAL	The DSN keyword specifies the data set naming template for the primary image copy data set that IMS HP Image Copy dynamically allocates.	"DSN keyword" on page 183
DSN2	GLOBAL	The DSN2 keyword specifies the data set naming template for the secondary image copy data set that IMS HP Image Copy dynamically allocates.	"DSN2 keyword" on page 183
DSN*n*	GLOBAL	The DSN*n* keyword specifies the data set naming template for the third to seventh image copy data sets that IMS HP Image Copy dynamically allocates.	"DSNn keyword" on page 184
ICHLQ	GLOBAL, GROUP, CRC	The ICHLQ keyword specifies the data set name prefix for the image copy data set.	"ICHLQ keyword" on page 202
ICHLQ2	GLOBAL, GROUP, CRC	The ICHLQ2 keyword specifies the data set name prefix for the secondary image copy data set.	"ICHLQ2 keyword" on page 204
ICHLQ*n*	GLOBAL, GROUP, CRC	The ICHLQ*n* keyword specifies the data set name prefix for the *n*th image copy data set.	"ICHLQn keyword" on page 205
ICNMRULE	GLOBAL, GROUP, CRC	The ICNMRULE keyword selects the naming convention for the output image copy data set when used together with ICOUT=*|(*,*).	"ICNMRULE keyword" on page 206

Keywords for defining attributes of image copy data sets

The following table summarizes the keywords for specifying the attributes for image copy data sets.

Table 78: Keywords for attributes for image copy data sets

Keyword	Statement	Description	Topic
DSNTYPE	GLOBAL, GROUP, CRC	The DSNTYPE keyword specifies whether IMS HP Image Copy allocates large format data sets or basic format data sets for output image copy data sets.	"DSNTYPE keyword" on page 184
EXPDT	GLOBAL, GROUP, CRC	The EXPDT keyword specifies the expiration date for the output image copy data set.	"EXPDT keyword" on page 187
EXPDT2	GLOBAL, GROUP, CRC	The EXPDT2 keyword specifies the expiration date for the secondary output image copy data set.	"EXPDT2 keyword" on page 187
EXPDT*n*	GLOBAL, GROUP, CRC	The EXPDT*n* keyword specifies the expiration dates for the third to seventh output image copy data sets.	"EXPDTn keyword" on page 188
GDGBASE	GLOBAL	The GDGBASE keyword specifies whether IMS HP Image Copy creates a catalog entry for the generation data group.	"GDGBASE keyword" on page 193
GDGLIMIT	GLOBAL	The GDGLIMIT keyword specifies the maximum number of generation data sets that can be associated with the GDG that is being defined.	"GDGLIMIT keyword" on page 193
ICCAT	GLOBAL, GROUP, CRC	The ICCAT keyword specifies whether IMS HP Image Copy catalogs output image copy data sets.	"ICCAT keyword" on page 200
ICOUT	GLOBAL, GROUP, CRC	The ICOUT keyword specifies the DD name of the output image copy data set.	"ICOUT keyword" on page 207
KEYLABEL	GLOBAL, GROUP, CRC	The KEYLABEL keyword specifies the key label used for data set encryption.	"KEYLABEL keyword" on page 214
RETPD	GLOBAL, GROUP, CRC	The RETPD keyword specifies the RETPD (retention period) parameter for the output image copy data set.	"RETPD keyword" on page 228
RETPD2	GLOBAL, GROUP, CRC	The RETPD2 keyword specifies the RETPD (retention period) for the secondary output image copy data set.	"RETPD2 keyword" on page 229
RETPD*n*	GLOBAL, GROUP, CRC	The RETPD*n* keyword specifies the RETPD (retention period) for the third to seventh output image copy data sets.	"RETPDn keyword" on page 230
VOLCNT	GLOBAL, GROUP, CRC	The VOLCNT keyword specifies the number of tape volumes used for the output image copy data set.	"VOLCNT keyword" on page 264
VOLSER	GLOBAL, GROUP, CRC	The VOLSER keyword specifies the volume serial number of the tape volume used for the primary data set of the output image copy.	"VOLSER keyword" on page 265
VOLSER2	GLOBAL, GROUP, CRC	The VOLSER2 keyword specifies the volume serial number of the tape volume used for the secondary data set of the output image copy.	"VOLSER2 keyword" on page 266
VOLSER*n*	GLOBAL, GROUP, CRC	The VOLSER*n* keywords specify the volume serial number of the tape volume used for the third to the seventh data sets of the output image copy.	"VOLSERn keyword" on page 266

Keywords for data set stacking

The following table summarizes the keywords for data set stacking.

Table 79: Keywords for data set stacking			
Keyword	**Statement**	**Description**	**Topic**
STACK	GLOBAL, GROUP, CRC	The STACK keyword requests image copy stacking. This keyword specifies the ddname of the output stacks.	“STACK keyword” on page 241
STACKBASE	GLOBAL	The STACKBASE keyword specifies whether to use a temporary name or the actual name when dynamically allocating the dummy data set used for stacking.	“STACKBASE keyword” on page 243

Keywords for Advanced Image Copy Services

The following table summarizes the keywords that are related to Advanced Image Copy Services.

Table 80: Keywords for Advanced Image Copy Services			
Keyword	**Statement**	**Description**	**Topic**
DATA_MOVER	GLOBAL	The DATA_MOVER keyword defines the data mover utility for Advanced Image Copy Services.	“DATA_MOVER keyword” on page 173

Keywords for DBRC processing

The following table summarizes the keywords that are related to DBRC processing.

Table 81: Keywords for DBRC processing			
Keyword	**Statement**	**Description**	**Topic**
DBRC	GLOBAL	The DBRC keyword specifies to override the specification of DBRC in the IMSCTRL macro statement that is specified during IMS system definition.	“DBRC keyword” on page 178
NOTIFY	GLOBAL, GROUP, CRC	The NOTIFY keyword specifies to register output data sets to RECON.	“NOTIFY keyword” on page 220

Keywords for creating compressed image copies

The following table summarizes the keywords for creating compressed image copies.

Table 82: Keywords for creating compressed image copies			
Keyword	**Statement**	**Description**	**Topic**
COMP	GLOBAL, GROUP, CRC	The COMP keyword specifies whether to compress output image copy data.	“COMP keyword” on page 167
COMPMODE	GLOBAL	The COMPMODE keyword controls the priority of the compression methods for compressing the output image copy data sets. This keyword is effective only when the IDRC feature is activated by the JCL or the system.	“COMPMODE keyword” on page 167
COMPRTN	GLOBAL, GROUP, CRC	The COMPRTN keyword specifies the name of the compression routine that IMS HP Image Copy invokes to compress output image copy data.	“COMPRTN keyword” on page 169
ZIIPMODE	GLOBAL	The ZIIPMODE keyword specifies whether IMS HP Image Copy offloads eligible database workloads to zIIP processors.	“ZIIPMODE keyword” on page 269

Keywords for group processing

The following table summarizes the keywords for group processing.

Table 83: Keywords for group processing			
Keyword	**Statement**	**Description**	**Topic**
CAGRP	GROUP	The CAGRP keyword specifies the name of the change accumulation group (CA group) that is registered to the DBRC RECON data set.	"CAGRP keyword" on page 165
DBDSGRP	GROUP	The DBDSGRP keyword specifies the name of the database data set group (DBDS) that is registered to the DBRC RECON data set.	"DBDSGRP keyword" on page 177
FUNC	GROUP	The FUNC keyword specifies the function to be performed by IMS HP Image Copy for all data set groups or areas that are defined by the CAGRP keyword or the DBDSGRP keyword.	"FUNC keyword" on page 192

Keywords for storing reports in the IMS Tools KB repository

The following table summarizes the keywords for enabling the IMS Tools KB repository for storing reports.

Table 84: Keywords for storing reports in the IMS Tools KB repository			
Keyword	**Statement**	**Description**	
ITKBLOAD	GLOBAL	The ITKBLOAD keyword specifies the IMS Tools KB load module data set.	"ITKBLOAD keyword" on page 212
ITKBSRVR	GLOBAL	The ITKBSRVR keyword specifies the name of the IMS Tools KB server XCF group.	"ITKBSRVR keyword" on page 213

Keywords for buffer tuning

The following table summarizes the keywords for buffer tuning. Also see "Performance tips for IMS HP Image Copy" on page 385 to tune the buffers to achieve optimal performance.

Table 85: Keywords for buffer tuning			
Keyword	**Statement**	**Description**	**Topic**
DBBUF	GLOBAL, GROUP	The DBBUF keyword specifies the number of buffers to be used to access the database data set groups or areas.	"DBBUF keyword" on page 175
DSBUF	GLOBAL, CRC	The DSBUF keyword specifies the number of buffers to be used to access the input data set.	"DSBUF keyword" on page 181
ICBUF	GLOBAL, GROUP, CRC	The ICBUF keyword specifies the number of buffers to be used to access the output image copy data sets.	"ICBUF keyword" on page 200

Keywords for error handling

The following table summarizes the keywords for error handling.

Table 86: Keywords for error handling			
Keyword	**Statement**	**Description**	**Topic**
DRSNDSN	GLOBAL	The DRSNDSN keyword specifies the name of the data set that contains FABJDRSN control statements, which define the error reason codes and SMS reason codes of dynamic allocation.	"DRSNDSN keyword" on page 181
IC_ERROR	GLOBAL	The IC_ERROR keyword specifies to terminate all image copy processes for all database data sets when an error occurs in one of the image copy processes.	"IC_ERROR keyword" on page 210

Keyword	Statement	Description	Topic
RETCDDSN	GLOBAL	The RETCDDSN keyword specifies the name of the data set that contains HPSRETCD control statements, which define the return codes of IMS HP Image Copy processes.	"RETCDDSN keyword" on page 228
TIMECHK	GLOBAL, CRC	The TIMECHK keyword specifies whether to verify the time stamp in the image copy header record with the DBRC record.	"TIMECHK keyword" on page 249
WAITALOC	GLOBAL	The WAITALOC keyword specifies whether to display the WAIT option in message IEF238D when dynamic allocation on the tape unit fails.	"WAITALOC keyword" on page 267
WAITMSG	GLOBAL	The WAITMSG keyword specifies whether to display WTO message FABJ3929A on the operator console until dynamic allocation is done on the tape unit.	"WAITMSG keyword" on page 268
WAITTIME	GLOBAL	The WAITTIME keyword specifies the wait time for repeating the dynamic allocation on the tape unit when the dynamic allocation reason code (SVC99) is 214, 220, 228, or 484.	"WAITTIME keyword" on page 268

Examples for the Create Image Copy function

The following topics provide examples for using the Create Image Copy function.

To use DBRC without dynamically allocating the RECON data sets, you must add the DD statements for the DBRC RECON data sets, as shown in the following figure:

Figure 36: Sample DD statements for DBRC RECON data sets

```
//RECON1   DD  DSNAME=RECON1,DISP=SHR
//RECON2   DD  DSNAME=RECON2,DISP=SHR
//RECON3   DD  DSNAME=RECON3,DISP=SHR
```

Example for creating image copies with logical copy process

Use this example to run the Create Image Copy function to create image copies with the logical copy process.

Creating image copies with logical copy process—dynamic allocation enabled

The following is an example that shows how to invoke FABJMAIN to create image copies with the logical copy process. In this example, dynamic allocation is enabled.

Figure 37: JCL example: Logical copy

```
//EXAMPLE6 JOB
//         EXEC PGM=FABJMAIN
//STEPLIB  DD DISP=SHR,DSN=HPS.SHPSLMD0
//         DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMSDALIB DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//ICEPRINT DD SYSOUT=*
//ICERPRT  DD SYSOUT=*
//ICEDLIST DD SYSOUT=*
//ICEIN    DD *
  GLOBAL ICNMRULE=Y,ICHLQ=IMSIC
  CRC    DBD=HDAMDB01,DDN=HDAMDD01,ICOUT=(*,*,*),
         CRCTYPE=L,COMP=Y,COMPRTN=FABJCMP2
/*
```

The input image copy data set, compressed by FABJCMP1, is for the data set (DDN=HDAMDD01) of the database (DBD=HDAMDB01), and is dynamically allocated by the Create Image Copy function by use of the IC record in the DBRC.

The three output copies of the image copy data set are also dynamically allocated by the Create Image Copy function. The data set name of each copy is determined by IMS HP Image Copy as follows:

- Primary output data set: IMSIC.IC1.HDAMDB01.HDAMDD01.D*yyddd*.T*hhmmss*
- Secondary output data set: IMSIC.IC2.HDAMDB01.HDAMDD01.D*yyddd*.T*hhmmss*
- Third output data set: IMSIC.IC3.HDAMDB01.HDAMDD01.D*yyddd*.T*hhmmss*

where:

yyddd

Year and day.

hhmmss

Time in time stamp format.

The output image copy data sets are compressed by the FABJCMP2 routine.

Example for creating image copies with physical copy process

Use this example to run the Create Image Copy function to create image copies with the physical copy process.

Creating image copies with physical copy process—dynamic allocation enabled

The following figure is an example that shows how to invoke FABJMAIN to create image copies with the physical copy process. In this example, dynamic allocation is enabled.

Figure 38: JCL example: Physical copy

```
//EXAMPLE7 JOB
//         EXEC PGM=FABJMAIN
//STEPLIB  DD DISP=SHR,DSN=HPS.SHPSLMD0
//         DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMSDALIB DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//ICEPRINT DD SYSOUT=*
//ICERPRT  DD SYSOUT=*
//ICEDLIST DD SYSOUT=*
//ICEIN    DD *
  GLOBAL UNIT=TAPE,VOLCNT=99,ICHLQ=IMSIC
  GROUP  DBDSGRP=DBDSGRP1,STACK=STACK1,FUNC=CRC
/*
```

The input image copy data sets of the data set group defined by the DBDS group (DBDSGRP=DBDSGRP1) are dynamically allocated by the Create Image Copy function by use of the IC records in the DBRC.

The output image copy data sets are also dynamically allocated, one for each data set group, by the Create Image Copy function. The data set name of each image copy is determined by IMS HP Image Copy as follows:

- Image copy for DBDNAME=*dbdname*, DDNAME=*ddname*:
  IMSIC.IC1.*dbdname*.*ddname*.D*yyddd*.T*hhmmss*

where:

yyddd

Year and day.

hhmmss

Time in time stamp format.

All image copies are allocated to one tape device through the nonspecific volume request and all image copy data sets are stacked into one stack STACK1 and created on one or more tape volumes (up to 99).

Pointer checking online full-function databases

You can use IMS HP Image Copy to check pointers of IMS online full-function databases by using two features of IMS HP Image Copy: the HASH Check option with the TOIAUTO (or TOIAUTO_Q) keyword and the Advanced Image Copy Services (FASTIC).

By enabling these two features, you can run HASH pointer check for online databases in pseudo online pointer check mode. In this mode, HASH pointer check is run with automatic database start and stop operations, which

result in the databases being unavailable for the shortest amount of time possible. This function is called the *Online Pointer Checking function*.

The following topics explain how to check the pointers of online full-function databases by using the Online Pointer Checking function.

> **Restriction:** This function is supported only for IMS full-function databases. You cannot use this function for DEDBs. To check the pointers of online DEDB areas, use the Online Pointer Checker utility provided by IMS Fast Path Online Tools of IMS Fast Path Solution Pack. For more information, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

Topics:

- "Features for the Online Pointer Checking function (for full-function databases)" on page 142
- "Restrictions for the Online Pointer Checking function (for full-function databases)" on page 143
- "Running the Online Pointer Checking function (for full-function databases)" on page 144
- "DD statements for the Online Pointer Checking function (for full-function databases)" on page 145
- "Examples for running Online Pointer Checking for full-function databases" on page 151

Features for the Online Pointer Checking function (for full-function databases)

The Online Pointer Checking function that is run by the FABJMAIN program supports the features summarized in the following table.

Table 87: Features for the Online Pointer Checking function

Feature	Description	How to enable this feature
Pointer checking for online full-function database	The Online Pointer Checking function can be run for online databases with automatic database start and stop operations, which result in the databases being unavailable for the shortest amount of time possible.	• "HDPC keyword" on page 196 • "ICOUT keyword" on page 207 • "STACK keyword" on page 241 • "TOIAUTO keyword" on page 252 • "TOIAUTO_Q keyword" on page 255 • "FASTIC keyword" on page 190
Fast Recovery image copy	The Fast Recovery image copy enables you to recover database data sets quickly, reducing the total recovery time and the time that the database is unavailable.	"FASTIC keyword" on page 190
FDUMP option of Advanced Image Copy Services	The FDUMP option creates FlashCopy® files of the input databases. Then, IMS HP Image Copy starts a HASH check for the FlashCopy® files. The Input database can be made online when the FlashCopy® files are generated (before the HASH check process is run). The FlashCopy® files are deleted after HASH check is done.	"FASTIC keyword" on page 190

Feature	Description	How to enable this feature
Parallel processing	The Online Pointer Checking function can process more than one database data sets in parallel. Processing tasks in parallel decreases elapsed processing time.	• "IC/AIC statement" on page 156 • "CIC/ACIC statement" on page 156 • "FUNC keyword" on page 192 • "GRPLIM keyword" on page 194 • "TASKCTL keyword" on page 246
Database group processing	This feature processes all database data groups and areas that are registered in a change accumulation (CA) group or a database data set (DBDS) group in DBRC.	• "GROUP statement" on page 155 • "CAGRP keyword" on page 165 • "DBDSGRP keyword" on page 177
Dynamic allocation	IMS HP Image Copy dynamically allocates input and output data sets, such as database data sets, image copy data sets, log data sets, and change accumulation data sets. You do not have to provide a DD statement for each data set.	• "DBDALLOC keyword" on page 176 • "DSDALLOC keyword" on page 182 • "ICDALLOC keyword" on page 201
Logical relation search	The Online Pointer Checking function searches for logically related databases automatically.	• "DBALL keyword" on page 173 • "IDXSRCH keyword" on page 211
Site Default Generation utility	The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs.	"Specifying site default values for the FABJMAIN program" on page 59
Integration with IMS Tools Online System Interface	Using the IMS Tools Online System Interface ensures that the database being image copied is available and in the appropriate state. Time is saved because you need not manually bring the database down prior to image copy and up again after the image copy is complete.	• "TOIAUTO keyword" on page 252 • "TOIAUTO_Q keyword" on page 255
Central management of reports	IMS HP Image Copy supports the function of the IMS Tools KB Output repository, which enables you to store the reports that are generated by IMS HP Image Copy jobs. The use of IMS Tools KB Output repository helps you simplify management of IMS HP Image Copy reports.	"ITKBSRVR keyword" on page 213

Restrictions for the Online Pointer Checking function (for full-function databases)

Certain restrictions apply to the Online Pointer Checking function with the FABJMAIN program.

The Online Pointer Checking function can be used only for IMS full-function databases. You cannot run Online Pointer Checking for DEDBs.

Other restrictions and considerations that are common to using the IMS HP Image Copy functions and single-step HASH Check also apply. For such restrictions and considerations, see the following topics:

- "Restrictions for the Image Copy function" on page 72
- "Considerations for the Image Copy function" on page 69

Running the Online Pointer Checking function (for full-function databases)

To run the Online Pointer Checking function, you prepare a cataloged procedure, and specify DD statements and ICEIN control statement keywords in FABJMAIN JCL.

Procedure

1. Prepare a cataloged procedure for the Online Pointer Checking function. The following figure shows an example.
   Figure 39: FABJONPC cataloged procedure for the Online Pointer Checking function

```
//FABJONPC PROC HPICLIB='HPIC.SHPSLMD0',        HP IMAGE COPY LOAD LIBRARY
//             HPPCLIB='HPPC.SHPSLMD0',         HP POINTER CHECKER LOAD LIBRARY
//             GLXLIB='TOSI.SGLXLOAD',          TOOLS GENERIC EXIT LOAD LIBRARY
//             TOSILIB='TOSI.SFOILOAD',         TOSI LOAD LIBRARY
//             RESLIB='IMSVS.SDFSRESL',         IMS RESLIB
//             DBDLIB='IMSVS.DBDLIB',           IMS DBD LIBRARY
//             HPSSRC='HPS.SHPSSAMP(FABPVSAM)', HPS SAMPLE JCL LIBRARY
//             PRTBLK=6118   (133*46)       BLKSIZE OF PRINT DATA SETS
//*-------------------------------------------------------------------*
//HDPCPRO EXEC PGM=FABJMAIN
//STEPLIB   DD DISP=SHR,DSN=&HPICLIB
//          DD DISP=SHR,DSN=&HPPCLIB
//          DD DISP=SHR,DSN=&GLXLIB
//          DD DISP=SHR,DSN=&TOSILIB,
//          DD DISP=SHR,DSN=&RESLIB
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//DFSRESLB  DD DISP=SHR,DSN=&RESLIB
//IMS       DD DISP=SHR,DSN=&DBDLIB
//DFSPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//*-------------------------------------------------------------------*
//* REPORTS
//*-------------------------------------------------------------------*
//ICEPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//PRIMAPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//STATIPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//VALIDPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//EVALUPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SNAPPIT   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SUMMARY   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSUDUMP  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
```

2. If you need to start IMSplex, code the EXEC statement as follows:

```
//      EXEC PGM=FABJMAIN,REGION=nM,IMSPLEX=plex-name,DBRCGRP=dbrcgrp
```

   Where:

   IMSPLEX

   If you need to start IMSplex through the IMS HP Image Copy job, specify the IMSPLEX parameter.

   DBRCGRP

   If you use the DBRCGRP keyword of IMS, you must specify the DBRCGRP parameter.

3. Code the corresponding control statement in the ICEIN data set.
   To invoke the Online Pointer Checking function, the following statements and keywords must be specified in the ICEIN data set:
   - IC, AIC, CIC, or ACIC statement, or the GROUP statement with the FUNC keyword
   - HDPC=Y

- If IC or AIC statement, the TOIAUTO keyword or the TOIAUTO_Q keyword
- FASTIC keyword

> **Tip:** You can specify HDPC=Y, TOIAUTO, TOIAUTO_Q, FASTIC keywords in the site default table.

For ICEIN control statements, see "ICEIN control statements" on page 154. Examples are provided in "Examples for running Online Pointer Checking for full-function databases" on page 151.

> **Restrictions:**
> - If you use the CIC or the ACIC statement, the TOIAUTO or the TOIAUTO_Q keyword is ignored.
> - You must not specify DBDEFCTL or SORTEX in the JCL. The Online Pointer Checking function must be run with single-step HASH Check; when these DD statements are specified, IMS HP Image Copy attempts to run the job with multiple-step HASH Check.

4. Code the appropriate DD statements.
   Ensure you supply the DD statements that are required for HASH Check. For a list of DD statements, see "DD statements for the Online Pointer Checking function (for full-function databases)" on page 145.
5. Submit the JCL.

DD statements for the Online Pointer Checking function (for full-function databases)

DD statements are used to identify the source of input and the placement of output information. The following DD statements are supported for the Online Pointer Checking function that is run with the FABJMAIN program.

Table 88: DD statements for the Online Pointer Checking function

DDNAME	Use	Format	Required or optional
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMSDALIB	Input	PDS	Optional
RECON1 RECON2 RECON3	Input/Output	KSDS	Required if DBRC=Y (See Note 1)
IMS	Input	PDS	Required
ICEIN	Input	LRECL=80	Required
ICEPRINT	Output	LRECL=133	Required
DFSPRINT	Output	LRECL=122	Required
ICERPRT	Output	LRECL=133	Optional
ICEDLIST	Output	LRECL=133	Optional
FABJSTAT	Output	LRECL=133	Optional
datain	Input	VSAM or OSAM	Required (See Note 2)
dataout1	Output	RECFM=FB or VBS	Required (See Note 2)
dataout2	Output	RECFM=FB or VBS	Optional (See Note 2)
stack1	Output	RECFM=FB or VBS	Required (See Note 2)
stack2	Output	RECFM=FB or VBS	Optional (See Note 2)

DDNAME	Use	Format	Required or optional
DSSPRINT	Output	LRECL=133	Optional
DSSSTATS	Output	LRECL=133	Optional
CHKPTDD	Input/Output	LRECL=4096 or greater, RECFM=VB	Optional
HPSRETCD	Input	LRECL=80	Optional
FABJDRSN	Input	LRECL=80	Optional
FABJHRDD	Input/Output	RECFM=VB	Optional
FABJRDMP	Output	LRECL=(RECON CI size) +4, RECFM=VBA	Optional
SYSABEND or SYSUDUMP	Output	LRECL=133	Optional
DBDEFCTL	Output	LRECL=133	Required if run in multiple steps (See Note 3)
IMS2	Input	PDS	Required if you use FABPZWTO
FSESTAT	Input/Output	LRECL=134	Required if run in multiple steps (See Note 4)
HISTORY	Input/Output	KSDS	Required if run with the HISTORY option
PRIMAPRT	Output	LRECL=133	Required
STATIPRT	Output	LRECL=133	Required (See Note 4)
VALIDPRT	Output	LRECL=133	Required (See Note 4)
EVALUPRT	Output	LRECL=133	Required if run in single step
SUMMARY	Output	LRECL=133	Required if run in single step
SNAPPIT	Output	LRECL=133	Required (See Note 4)
SORTEX	Output	LRECL=40	Required if run in multiple steps (See Note 5)
SPMNIN	Input	LRECL=80	Optional
SPMNSPDT	Input/Output	Fixed record length	Optional

DDNAME	Use	Format	Required or optional

Notes:

1. Do not specify these DD statements if you want the RECON data sets dynamically allocated.
2. IMS HP Image Copy supports dynamic allocation for these data sets. To have these data sets dynamically allocated, do not specify the DD statements.
3. If you want to invoke the HD Pointer Checker HASH Check option in single step, do not supply this statement or specify DUMMY.
4. Besides the data sets in this table, the following data sets are allocated dynamically as temporary data sets. You do not need to specify them in the JCL, but you must not use these names in your JCL statements because they will be used by HD Pointer Checker:
   - STATIP*nn* DD (*nn*=01, 02, 03, ...99)
   - VALIDP*nn* DD (*nn*=01, 02, 03, ...99)
   - SNAPPI*nn* DD (*nn*=01, 02, 03, ...99)
   - FSESTA*nn* DD (*nn*=01, 02, 03, ...99)
5. If you want to invoke the HD Pointer Checker HASH Check option in single step, delete this statement. Do not specify DUMMY for the SORTEX DD statement.
6. DD names that start with the following prefixes are reserved for IBM® use: FABJ, ICE#, and HKT.

STEPLIB DD

This statement points to the load module library data sets. They must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=HPPC.SHPSLMD0
//         DD   DISP=SHR,DSN=TOSI.SGLXLOAD
//         DD   DISP=SHR,DSN=TOSI.SFOILOAD
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

where:

HPS.SHPSLMD0

The name of the library that contains the load modules of IMS HP Image Copy.

HPPC.SHPSLMD0

The name of the library that contains the load modules of IMS HP Pointer Checker.

TOSI.SGLXLOAD

TOSI.SFOILOAD

The names of the libraries that contain the load modules of IMS Tools Generic exit and IMS Tools Online System Interface, which are provided by IMS Tools Base.

IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

To use the IMS HP Image Copy site default table, you must specify the library that contains the IMS HP Image Copy site default table.

If STEPLIB is unauthorized because it specifies libraries concatenated to IMS.SDFSRESL, you must include a DFSRESLB DD statement.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMSDALIB DD

This statement specifies the dynamic allocation members for the database, the index, and the RECON data sets. Allocation of these data sets is attempted in the following order:

1. DD statements found in the JCL stream
2. Dynamic allocation members in the IMSDALIB concatenation
3. Dynamic allocation members in the JOBLIB or STEPLIB concatenation

For dynamic allocation of HALDB databases, RECON data sets are used instead of this DD statement.

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

IMS DD

This statement defines the library that contains the DBD describing the database to dump, generally DSNAME=IMS.DBDLIB. The data set must reside on a direct-access volume.

ICEIN DD

This statement is required. It specifies the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input stream (DD * or DD DATA).
For details, see "ICEIN control statements" on page 154.

ICEPRINT DD

This statement is required. It specifies the output messages data set. The IMS HP Image Copy main module generates messages in this data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

DFSPRINT DD

This statement specifies the required output message data set. The data set contains messages from the IMS HP Image Copy module that has alias name DFSUDMP0 or DFSURDB0. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

If this DD statement is not specified, IMS HP Image Copy ends abnormally with U3905.

ICERPRT DD

This statement specifies the optional report data set. This data set contains the Image Copy Dump Process report. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

ICEDLIST DD

This statement specifies the optional output message data set. This data set contains the DBRC report for DBRC commands, such as the NOTIFY.IC, the NOTIFY.UIC, and the CHANGE.IC commands. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

FABJSTAT

This statement specifies the optional report data set. This data set contains the Data Set Statistics report. It can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT).

datain

This statement defines the input data set to be dumped. The ddname on this statement must be the same as the one in the DBD that describes this data set. You can request the Image Copy function to dynamically allocate the input data set using the DFSMDA member. To dynamically allocate the data set, omit this DD statement and specify the DBDALLOC=YES parameter in the ICEIN data set. IMS HP Image Copy determines the optimal buffer size for each data set.

***dataout1* DD or *stack1* DD**

This statement defines the first copy of the dumped output data set. One DD statement is required for each data set to be dumped unless the output data set is dynamically allocated. The ddname can be any 1- to 8-character string, but the ddname must appear in the associated utility control statement. The output device must be either a direct-access device or a tape. Standard labels must be used. If the output is a direct-access device, BLKSIZE is determined by the system to optimize output DASD BLKSIZE. If BLKSIZE is specified in the JCL, that BLKSIZE is used.

You can request the Image Copy function to allocate the output data set dynamically by omitting this DD statement and specifying the ICDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

For details, see "ICOUT keyword" on page 207 and "STACK keyword" on page 241.

***dataout2* DD or *stack2* DD**

This statement is required only if the associated utility control statement requests two copies of the dump. The name must appear in the control statement. The name must be that of either the tape or the direct-access device. Standard labels must be used. If the output is a direct-access device, BLKSIZE is determined by the system to optimize output DASD BLKSIZE. If BLKSIZE is specified in the JCL, that BLKSIZE is used. If either of the two output copies has an "open" problem (message DFS301A) or fails the first PUT operation to either output data set (message DFS319A), the current control statement is terminated and the next control statement is processed.

Once the utility has proceeded beyond the first PUT, all I/O errors caused by output data set result in RC=08, but the utility continues to copy to the remaining output data set. Each image copy control statement is treated as an independent copy; the last return code is the highest received for the job.

You can request the Image Copy function to allocate the output data set dynamically by omitting this DD statement and specifying the ICDALLOC=YES parameter and its associated allocation parameters in the ICEIN data set.

For details, see "ICOUT keyword" on page 207 and "STACK keyword" on page 241.

DSSPRINT DD

This statement specifies the output messages data set for the messages that DFSMSdss™ generates when the Advanced Image Copy Services is used. If this statement is present, DFSMSdss™ issues messages that are prefixed with ADR to the data set. These messages provide processing information and any errors that occurred during processing.

DSSSTATS DD

This statement specifies the optional output message data set for messages on statistics of DFSMSdss User Interaction module (UIM) processing when Advanced Image Copy Services is used. If this statement is present, IMS HP Image Copy creates the DFSMSDSS User Interaction Module (UIM) Statistics report, which includes information on UIM processing, such as the start and the end time, task ID, and target database name.

CHKPTDD DD

A function-unique DD statement for the Checkpoint Restart option. The DD statement is valid when RESTART=Y|N|C is specified. This statement defines the checkpoint file. It must be the same file used for a both a particular checkpoint and for the associated attempted subsequent restarts. Additionally, the file must be preallocated and cataloged before the requested checkpoint or restart. If the checkpoint file (CHKPTDD) is not defined in the job step or is DD DUMMY, then the Checkpoint Restart function is bypassed. However, the requested functions are attempted. For details, see "RESTART keyword" on page 227.

HPSRETCD DD

This statement is a function-unique DD statement for the Return Code Handling option. This optional input data set contains the user-specified control statements that define the return codes of the IMS HP Image Copy process.

For details, see "HPSRETCD control statement" on page 270.

FABJDRSN DD

This statement specifies the input data set that contains the user-specified control statements for defining the error reason code (S99ERROR) and the SMS reason code (S99ERSN) for dynamic allocation.

For details, see "FABJDRSN control statement" on page 272.

FABJHRDD DD

A function-unique DD statement for Checkpoint Restart, which is used with the HASH option of the RESTART keyword. The DD statement is valid when RESTART=(Y,HASH) and HDPC=Y are specified. The file must be preallocated and cataloged before running the requested checkpoint or restart. If the HASH record file (FABJHRDD) is not defined in the job step or is DD DUMMY, the HASH record validation that uses FABJHRDD is bypassed.

This DD defines the validation of the HASH record file, which is used at restart time. It must be the same file that is used for both a particular checkpoint and for the associated attempted subsequent restarts. If HASH Check finds, at the restart time, the same hash error as in the previous run, IMS HP Image Copy regards it as the database having fatal error, and does not restart the next run.

FABJRDMP DD

An optional output data set in which the RECON REPRO output is stored for diagnosis use in the QSAM format. IMS HP Image Copy runs REPRO and stores the RECON data set into the data set of FABJRDMP DD, when the DD is defined under the following conditions:

- DBDS record is found in RECON, but its corresponding database record is not found in the Online Pointer Checking function.
- IC record is found in RECON, but its corresponding DBDS record is not found in the Recovery function.

Tape drives are not supported.

This DD is optional.

The specification is as follows:

```
//FABJRDMP DD  DISP=OLD,DSN=dataset_name
```

where *dataset_name* is the data set name where REPRO output is stored.

SYSABEND DD

SYSUDUMP DD

These statements define a dump data set. If both statements are present, the last occurrence is used for the dump.

IMS2 DD

This statement defines the library that contains the FABPZWTO user exit, the partition selection exit module, or both. The data set must reside on a direct-access volume. It is required if you want to use FABPZWTO, the partition selection exit, or both.

FSESTAT DD

This statement defines the work data set used by the HDAM, HIDAM, HDAM, and PHIDAM scan processes. If BLKSIZE is coded on the DD statement, it must be a multiple of 134.

HISTORY DD

This optional data set defines the HISTORY data set (VSAM KSDS) that is used as input to the DB Historical Data Analyzer and Space Monitor of IMS HP Pointer Checker. When the HISTORY option is specified, this data set is required, and must be allocated and initialized by the DB Historical Data Analyzer utility before you run IMS HP Image Copy. DISP=SHR must be used. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

PRIMAPRT DD

This statement defines the output data set that contains the primary reports produced by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM HASH Check option processes. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

STATIPRT DD

This statement defines the output data set that contains the statistics reports generated by HISAM, HDAM, HIDAM, PHDAM, and PHIDAM. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

VALIDPRT DD

This statement defines the output data set that contains the legend and the validation reports produced by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM HASH Check option processes. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

EVALUPRT DD

This statement defines the output data set containing the evaluation reports. This DD statement is required. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

SUMMARY DD

This statement defines the output data set containing the summary reports. It is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SNAPPIT DD

This statement defines the output data set that contains the block maps and block dumps that the HDAM, HIDAM, HDAM, and PHIDAM scan processes produce. The block maps and block dumps are produced when the HDAM HIDAM, HDAM, and PHIDAM scan process detects pointer errors, incorrect FSEAPs or FSEs, or T2 errors. The statement is required. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

SORTEX DD

This statement defines the output data set that contains 40 byte sort records written by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM processes. It contains pointer type records for both each segment type and each segment type records. This data set is used as the input data set for the subsequent EVALUATE process. The statement is required. LRECL must be 40, and BLKSIZE must be a multiple of 40. If

you want to invoke the HD Pointer Checker HASH Check option in single step, delete this statement. Do not specify "DUMMY" for the SORTEX DD.

SPMNIN DD

This optional input data set contains the control statements for Space Monitor of IMS HP Pointer Checker. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

SPMNSPDT DD

This optional input/output sequential data set is the graph record data set for Space Monitor. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

Examples for running Online Pointer Checking for full-function databases

Use the following JCL examples to run the Online Pointer Checking function (pseudo online pointer check mode).

Subtopics:

- "Online pointer checking—without creating image copy data sets" on page 151
- "Online pointer checking—keeping FlashCopy files as image copies" on page 152
- "Online pointer checking—creating image copy data sets in standard image copy format" on page 153

Online pointer checking—without creating image copy data sets

The following JCL example is for running the Online Pointer Checking function (pseudo online pointer check mode). In this example, the databases are quiesced to make them temporarily unavailable, and FlashCopy® files are deleted at the end of the job.

Figure 40: JCL example for Online Pointer Checking—without creating image copy data sets

```
//        EXEC PGM=FABJMAIN
//STEPLIB DD DISP=SHR,DSN=HPIC.SHPSLMD0  <=== HPIC library
//        DD DISP=SHR,DSN=HPPC.SHPSLMD0  <=== HPPC library
//        DD DISP=SHR,DSN=ITB.SFOILOAD   <=== Tools Base
//        DD DISP=SHR,DSN=ITB.SGLXLOAD   <=== Tools Base
//        DD DISP=SHR,DSN=IMS.SDFSRESL   <=== IMS library
//        DD DISP=SHR,DSN=IMS.MDALIB     <=== IMS MDA library
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//DFSPRINT DD SYSOUT=A
//SYSPRINT DD SYSOUT=A
//*-------------------------------------------------------------------*
//* REPORT DDs
//*-------------------------------------------------------------------*
//ICEPRINT DD SYSOUT=A
//PRIMAPRT DD SYSOUT=A
//STATIPRT DD SYSOUT=A
//VALIDPRT DD SYSOUT=A
//EVALUPRT DD SYSOUT=A
//SNAPPIT  DD SYSOUT=A
//SUMMARY  DD SYSOUT=A
//SYSUDUMP DD SYSOUT=A
//*-------------------------------------------------------------------*
//* HPIC Keywords
//*-------------------------------------------------------------------*
//ICEIN    DD *
  GLOBAL   DBRC=Y,
           HDPC=Y,
           FASTIC=(PREF,FDUMP),
           TOIAUTO_Q=Y,
           SHDWDSN=&SHDWHLQ..&DBD..&DDN..IC,
           SHDWHLQ=SHADOW,
           DBALL=Y
  AIC      DBD=DBHDAM,ICOUT=%NO
//*
```

In this example:

- DBHDAM has index databases, and logical relationship with other databases.
- DBALL=Y allows to omit the names of related databases.

This JCL runs an IMS HP Image Copy job, and goes through the following processes:

1. The IMS HP Image Copy job starts for the IMS online databases.
2. The TOIAUTO_Q=Y keyword causes IMS HP Image Copy to issue the database quiesce command to stop the databases.
3. The FASTIC=(PREF,FDUMP) keyword causes IMS HP Image Copy to create FlashCopy® files of the databases. The FlashCopy® data set names are defined by SHDWDSN=&SHDWHLQ..&DBD..&DDN..IC and SHDWHLQ=SHADOW.
4. The TOIAUTO_Q=Y keyword causes IMS HP Image Copy to restart the databases.
5. The HDPC=Y and FASTIC=(PREF,FDUMP) keywords cause IMS HP Image Copy to run a HASH pointer check for the FlashCopy® files.
6. The FASTIC=(PREF,FDUMP) keyword causes IMS HP Image Copy to delete the FlashCopy® files. The ICOUT=%NO keyword causes IMS HP Image Copy to not register the IC records to DBRC RECON data sets.
7. IMS HP Image Copy job ends.

Online pointer checking—keeping FlashCopy® files as image copies

The following JCL example is for running the Online Pointer Checking function (pseudo online pointer check mode). In this example, the IMS /DBRECOVERY command is issued to make the databases temporarily unavailable, and the FlashCopy® files are kept as image copy data sets.

Figure 41: JCL example for Online Pointer Checking—keeping FlashCopy® files as image copies

```
//       EXEC PGM=FABJMAIN
//STEPLIB DD DISP=SHR,DSN=HPIC.SHPSLMD0  <=== HPIC library
//        DD DISP=SHR,DSN=HPPC.SHPSLMD0  <=== HPPC library
//        DD DISP=SHR,DSN=ITB.SFOILOAD   <=== Tools Base
//        DD DISP=SHR,DSN=ITB.SGLXLOAD   <=== Tools Base
//        DD DISP=SHR,DSN=IMS.SDFSRESL   <=== IMS library
//        DD DISP=SHR,DSN=IMS.MDALIB     <=== IMS MDA library
//*--------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*--------------------------------------------------------------------*
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//DFSPRINT DD SYSOUT=A
//SYSPRINT DD SYSOUT=A
//*--------------------------------------------------------------------*
//* REPORT DDs
//*--------------------------------------------------------------------*
//ICEPRINT DD SYSOUT=A
//PRIMAPRT DD SYSOUT=A
//STATIPRT DD SYSOUT=A
//VALIDPRT DD SYSOUT=A
//EVALUPRT DD SYSOUT=A
//SNAPPIT  DD SYSOUT=A
//SUMMARY  DD SYSOUT=A
//SYSUDUMP DD SYSOUT=A
//*--------------------------------------------------------------------*
//* HPIC Keywords
//*--------------------------------------------------------------------*
//ICEIN    DD *
  GLOBAL   DBRC=Y,
           HDPC=Y,
           FASTIC=(PREF,COPY),
           TOIAUTO=Y,
           NOTIFYMODE=COND,
           DSN=&ICHLQ..&DBD..&DDN..&DATE.,
           ICHLQ=ICHLQ,
           DBALL=Y
  AIC      DBD=DBHDAM,ICOUT=*
//*
```

In this example:

- DBHDAM has index databases, and logical relationship with other databases.
- DBALL=Y allows to omit the names of related databases.

This JCL runs an IMS HP Image Copy job, and goes through the following processes:

1. The IMS HP Image Copy job starts for the IMS online databases.
2. The TOIAUTO=Y keyword causes IMS HP Image Copy to issue the IMS /DBRECOVERY command to stop the databases.
3. The FASTIC=(PREF,COPY) keyword causes IMS HP Image Copy to create FlashCopy® files of the databases. The FlashCopy® data set names are defined by DSN=&ICHLQ..&DBD..&DDN..&DATE., and ICHLQ=ICHLQ.
4. The TOIAUTO=Y keyword causes IMS HP Image Copy to issue the IMS /START command to restart the databases.
5. The HDPC=Y and FASTIC=(PREF,COPY) keywords cause IMS HP Image Copy to run a HASH pointer check for the FlashCopy® files.
6. The FASTIC=(PREF,COPY) and ICOUT=* keywords cause IMS HP Image Copy to keep the FlashCopy® files as Fast Recovery image copy data sets. The ICOUT=* keyword causes IMS HP Image Copy to register the IC records to DBRC RECON data sets.
7. The IMS HP Image Copy job ends.

Online pointer checking—creating image copy data sets in standard image copy format

The following JCL example is for running the Online Pointer Checking function (pseudo online pointer check mode). In this example, the IMS /DBDUMP command is used to make the databases temporarily unavailable, and image copy data sets in standard image copy format are created.

Figure 42: JCL example for Online Pointer Checking—creating image copy data sets in standard image copy format

```
//       EXEC PGM=FABJMAIN
//STEPLIB DD DISP=SHR,DSN=HPIC.SHPSLMD0  <=== HPIC library
//        DD DISP=SHR,DSN=HPPC.SHPSLMD0  <=== HPPC library
//        DD DISP=SHR,DSN=ITB.SFOILOAD   <=== Tools Base
//        DD DISP=SHR,DSN=ITB.SGLXLOAD   <=== Tools Base
//        DD DISP=SHR,DSN=IMS.SDFSRESL   <=== IMS library
//        DD DISP=SHR,DSN=IMS.MDALIB     <=== IMS MDA library
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//DFSRESLB DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS      DD DISP=SHR,DSN=IMS.DBDLIB
//DFSPRINT DD SYSOUT=A
//SYSPRINT DD SYSOUT=A
//*-------------------------------------------------------------------*
//* REPORT DDs
//*-------------------------------------------------------------------*
//ICEPRINT DD SYSOUT=A
//PRIMAPRT DD SYSOUT=A
//STATIPRT DD SYSOUT=A
//VALIDPRT DD SYSOUT=A
//EVALUPRT DD SYSOUT=A
//SNAPPIT  DD SYSOUT=A
//SUMMARY  DD SYSOUT=A
//SYSUDUMP DD SYSOUT=A
//*-------------------------------------------------------------------*
//* HPIC Keywords
//*-------------------------------------------------------------------*
//ICEIN    DD *
  GLOBAL   DBRC=Y,
           HDPC=Y,
           FASTIC=(PREF,FDUMP),
           TOIAUTO=(Y,NO,DBD),
           NOTIFYMODE=COND,
            SHDWDSN=&SHDWHQ..&DBD..&DDN..IC,
           SHDWHLQ=SHADOW,
           DSN=&ICHLQ..&DBD..&DDN..&DATE.,
           ICHLQ=ICHLQ,
           DBALL=Y
  AIC      DBD=DBHDAM,ICOUT=*
//*
```

In this example:

- DBHDAM has index databases, and logical relationship with other databases.
- DBALL=Y allows to omit the names of related databases.

This JCL runs an IMS HP Image Copy job, and goes through the following processes:

1. The IMS HP Image Copy job starts for the IMS online databases.
2. The TOIAUTO=(Y,NO,DBD) keyword causes IMS HP Image Copy to issue the IMS /DBDUMP command to stop the databases.
3. The FASTIC=(PREF,FDUMP) keyword causes IMS HP Image Copy to create FlashCopy® files of the databases. The FlashCopy® data set names are defined by SHDWDSN=&SHDWHLQ..&DBD..&DDN..IC and SHDWHLQ=SHADOW.
4. The TOIAUTO=(Y,NO,DBD) keyword causes IMS HP Image Copy to issue the IMS /START command to restart the databases.
5. The HDPC=Y and FASTIC=(PREF,FDUMP) keywords cause IMS HP Image Copy to run a HASH pointer check for the FlashCopy® files.
6. The FASTIC=(PREF,FDUMP) and ICOUT=* keywords cause IMS HP Image Copy to create image copy data sets in the standard image copy format from the FlashCopy® files. The ICOUT=* keyword causes IMS HP Image Copy to register the IC records to DBRC RECON data sets.
7. The FASTIC=(PREF,FDUMP) keyword causes IMS HP Image Copy to delete the FlashCopy® files.
8. The IMS HP Image Copy job ends.

Control statements and keywords

Control statements for IMS HP Image Copy functions run by the FABJMAIN program are supplied through ICEIN, HPSRETCD, FABJDRSN, and ICEFICO data sets.

Topics:

- "ICEIN control statements" on page 154
- "ICEIN control statement keywords" on page 158
- "HPSRETCD control statement" on page 270
- "FABJDRSN control statement" on page 272
- "ICEFICO control statement" on page 273

ICEIN control statements

The ICEIN data set contains your description of the processing that is to be done by the Image Copy function, the Recovery function, and the Create Image Copy function.

ICEIN is a mandatory input data set. You must specify the control statements that request a function of IMS HP Image Copy and its options.

This control data set usually resides in the input stream. However, it can also be defined as a member of a sequentially partitioned data set. The length of the ICEIN data set must be fixed at 80 bytes. BLKSIZE, if specified, must be a multiple of 80. The ICEIN data set contains one or more combinations of the following control statements:

- GLOBAL
- GROUP
- IC/AIC
- CIC/ACIC
- RCV
- CRC
- WAIT

These control statements can be coded as shown in the following figure.

Figure 43: ICEIN control statements

```
//ICEIN DD *
   GLOBAL   DBRC=Y,DBDALLOC=Y,ICDALLOC=Y
   GROUP    CAGRP=PAYROLL,      /* IC 6 DBDS */
            STACK=STACK1,
            FUNC=IC
   IC       DBD=HDAM0123,       /* IC 1 DBD  */
            DDN=HDAM0123,
            STACK=STACK1,
            COMP=Y,
            HDPC=Y
   IC       DBD=DEDB0123,       /* IC 1 AREA */
            AREA=AR00001,
            STACK=STACK1,
            COMP=Y,DEDBPC=Y
/*
```

IMS HP Image Copy can perform only one function within a job step; batch image copy, concurrent image copy, database recovery, or create image copy.

The maximum number of GROUP, IC, AIC, CIC, ACIC, and CRC statements that you can specify in one job step for an IMS HP Image Copy function is 2048.

A control statement can contain uppercase alphabetic characters, numeric characters, and the following special characters:

Asterisk (*)
Comma (,)
Equal sign (=)
Parenthesis ( )
Forward slash (/)

GLOBAL statement

The GLOBAL (abbreviated as GL) statement contains the keywords that specify the options to be applied to the entire IMS HP Image Copy process.

Specify only one GLOBAL statement for the IMS HP Image Copy process. This statement must be the first control statement in the ICEIN data set.

The internal default of GLOBAL options can be replaced by using a user default table that is generated with the IMS HP Image Copy Site Default Generation utility. For more information about generating a user default table, see “Setting default values for the FABJMAIN program” on page 58.

Important:

- The keyword parameters that are specified on the GLOBAL statement apply to all the processes that are run in that job step.
- IMS HP Image Copy determines the global values for the job step by reading the keyword parameters from the site default table and the GLOBAL statement.
- When same keywords are specified on both the site default table and the GLOBAL statement, the keyword parameter that is specified on the GLOBAL statement will be in effect.

For a list of keywords that can be specified for the GLOBAL statement, see “Relation of keywords to ICEIN control statements” on page 158.

GROUP statement

The GROUP (abbreviated as GR) statement enables group processing. It can be used with the IC/AIC, CIC/ACIC, or CRC statement.

The GROUP statement contains the following mandatory keywords:

- FUNC
- Either DBDSGRP or CAGRP

If both the GROUP and the GLOBAL statements are specified, the option parameters specified for the GROUP statement override the option parameters in the GLOBAL statement.

Group processing requires DBRC to be active. The specified DBDS group or CA group must be registered to DBRC. Group processing is not supported for the Recovery function.

For a list of keywords that can be specified for the GROUP statement, see "Relation of keywords to ICEIN control statements" on page 158.

IC/AIC statement

The IC/AIC statement invokes the batch image copy process for the specified database data set or the area data set.

If the AIC statement is specified, the Image Copy function works in parallel.

If both the IC/AIC and the GLOBAL statements are specified, the option parameters specified for the IC/AIC statement are superior to the option parameters specified for the GLOBAL statement.

The IC/AIC statement contains the following mandatory keyword:

- DBD

For a list of keywords that can be specified for the IC and AIC statements, see "Relation of keywords to ICEIN control statements" on page 158.

CIC/ACIC statement

The CIC/ACIC statement invokes the concurrent image copy process for the specified data set or the area data set.

If the ACIC statement is specified, the concurrent image copy function works in parallel.

If both the CIC/ACIC and the GLOBAL statements are specified, the option parameters specified for the CIC/ACIC statements are superior to the option parameters specified for the GLOBAL statement.

The CIC/ACIC statement contains the following mandatory keyword:

- DBD

For a list of keywords that can be specified for the CIC and ACIC statements, see "Relation of keywords to ICEIN control statements" on page 158.

RCV statement

The RCV statement invokes the recovery process for the specified database data set or the area data set.

If both the RCV and the GLOBAL statements are specified, the option parameters specified for the RCV statements are superior to the option parameters specified for the GLOBAL statement.

> **Note:** The RCV process recovers only one DBDS or ADS in one execution. When the DDN or the ADDN is not specified, the RCV process recovers the first DBDS or ADS registered to DBRC.

The RCV statement contains the following mandatory keywords:

- DBD
- Either AREA or DDN

For a list of keywords that can be specified for the RCV statement, see "Relation of keywords to ICEIN control statements" on page 158.

CRC statement

The CRC statement invokes the Create Image Copy process for the specified image copy data set of the database data set or the area data set.

If both the CRC and the GLOBAL statements are specified, the option parameters specified for the CRC statements override the option parameters specified for the GLOBAL statement.

The CRC statement contains the following mandatory keyword:

- DBD

For a list of keywords that can be specified for the CRC statement, see "Relation of keywords to ICEIN control statements" on page 158.

WAIT statement

The WAIT statement requests that the process wait for all tasks that are issued before this statement to complete before processing any subsequent tasks.

The WAIT statement has no keywords.

Control statement syntax

You must follow the coding conventions when using IMS HP Image Copy functions with the FABJMAIN program. These conventions apply only to the ICEIN control statement.

The coding conventions are as follows:

- An ICEIN control statement consists of a control statement name and one or more process option parameters. An option parameter consists of a keyword and an operand. The syntax is:

  ```
  Control-Statement blank option-parameter,option-parameter,...
  ```

  For example:

  ```
  GLOBAL DBRC=Y,DBDALLOC=Y
  ```

- Only one GLOBAL statement can be specified in the ICEIN data set.
- The GLOBAL statement must be specified as the first control statement.
- A control statement must be coded in columns 2 - 72.
- A control statement cannot contain two or more control statement names.
- A control statement name must be separated from the first option parameter by one or more blanks.
- A control statement name and the first option parameter must be written on the line.
- When more than one option parameter is specified, they must be separated by a comma (,) and no blanks are allowed between these option parameters.
- Option parameters can be continued to the next control statement line.
- A control statement must start with a control statement name and end with a comma after the option parameter.
- Option parameters can run into the next line and begin from column 2.
- An option parameter is constructed with a keyword and its operand associated value separated by an equal sign (=).
- No blanks are allowed before or after the equal sign (=).
- If two or more values are needed to specify the keyword, the set of values must begin with a parenthesis '(' and end with a parenthesis ')'. The values must be separated by a comma.
- Comments can follow the last option parameter on each control statement line separated by at least one blank.
- A comment must begin with an asterisk (*) in column 1.

The following figure shows the syntax of ICEIN control statement.

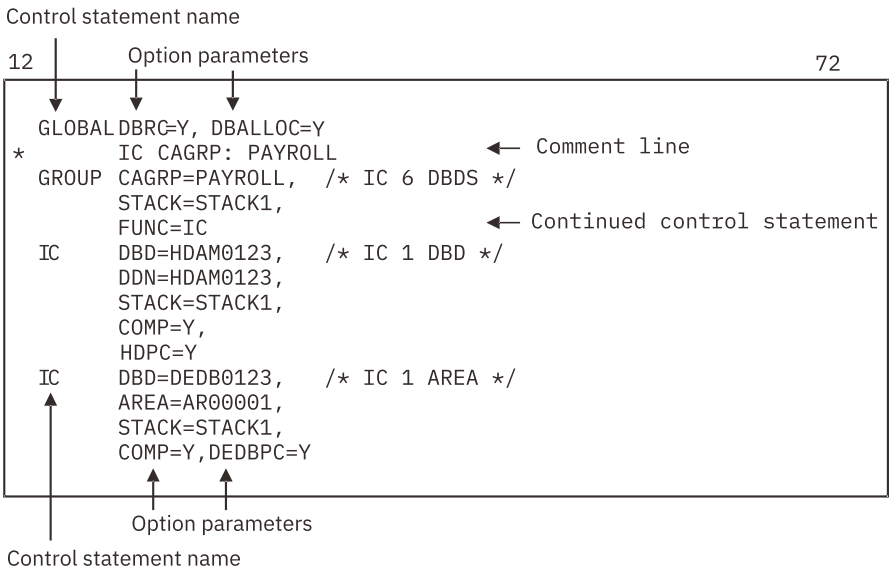


Figure 44: ICEIN control statement syntax

ICEIN control statement keywords

The ICEIN control statement keywords control the behavior of the processes run by the FABJMAIN program.

To invoke the IMS HP Image Copy function, you must specify the necessary option parameters in the control statements. You can specify the same option parameter in different control statements. For example, you can specify the option parameters ICDALLOC and UNIT in control statements GLOBAL, GROUP, IC, AIC, CIC, ACIC, RCV, and CRC.

If you specify an option parameter, that parameter is effective within the control statement.

For example:

- If you specify an option parameter in the GLOBAL statement, that option is effective for the entire IMS HP Image Copy process.
- If you specify an option parameter in the GROUP statement, that option is effective for all DBDs in the DBDS/CA group that is specified by DBDSGRP or CAGRP.
- If you specify an option parameter in the IC, AIC, CIC, ACIC, RCV, or CRC control statement, that option is effective for the DBD specified by the mandatory parameters DBD and DDN, or AREA.

These option parameters override the identical options in the GLOBAL control statement.

Relation of keywords to ICEIN control statements

The following table summarizes the relation of keywords to ICEIN control statements.

The abbreviations used in the table are as follows:

O

Optional.

R

Required.

S

Means that you must select a parameter for the keyword.

Table 89: Relation of keywords to ICEIN control statements

Keyword	GLOBAL	GROUP	IC/AIC	CIC/ACIC	RCV	CRC	Site default option	Related keyword
"ADDN keyword" on page 162	-	-	-	-	O	-	-	AREA

Keyword	GLOBAL	GROUP	IC/AIC	CIC/ACIC	RCV	CRC	Site default option	Related keyword
"ADXCFGRP keyword" on page 162	O	-	-	-	-	-	O	ITKBSRVR SENSOR TOIXCFGR
"AREA keyword" on page 163	-	-	O	O	S	O	-	DBD
"BYPDBAUTH keyword" on page 164	O	-	-	-	-	-	O	DBDALLOC DBRC HDPC TOIAUTO TOIAUTO_Q VIC
"CAGRP keyword" on page 165	-	S	-	-	-	-	-	FUNC
"CAUNIT keyword" on page 165	O	-	-	-	O	-	O	IGNORCAT
"CIC_KSDS keyword" on page 166	O	-	-	-	-	-	O	-
"COMP keyword" on page 167	O	O	O	O	-	O	O	COMPMODE COMPRTN CRCTYPE
"COMPMODE keyword" on page 167	O	-	-	-	-	-	O	COMP COMPRTN
"COMPRTN keyword" on page 169	O	O	O	O	-	O	O	COMP COMPMODE
"CRCTYPE keyword" on page 170	O	O	-	-	-	O	O	COMP
"DATACLAS keyword" on page 171	O	O	O	O	-	O	O	-
"DATACLAS2 keyword" on page 171	O	O	O	O	-	O	O	-
"DATACLASn keyword" on page 172 (*n*=3-7)	O	O	O	O	-	O	O	-
"DATA_MOVER keyword" on page 173	O	-	-	-	-	-	O	FASTIC
"DBALL keyword" on page 173	O	-	-	-	-	-	O	-
"DBBUF keyword" on page 175	O	O	O	O	O	-	O	-
"DBD keyword" on page 175	-	-	R	R	R	R	-	-
"DBDALLOC keyword" on page 176	O	O	O	O	O	-	-	-
"DBDSGRP keyword" on page 177	-	S	-	-	-	-	-	FUNC
"DBRC keyword" on page 178	O	-	-	-	-	-	O	-
"DDN keyword" on page 178	-	-	O	O	S	O	-	DBD
"DEDBPC keyword" on page 179	O	O	O	O	-	-	O	-
"DEL_ICDS keyword" on page 180	O	-	-	-	-	-	O	ICDALLOC DBRC NOTIFYMODE RESTART RSTTYPE RSTTYPE_STK VIC
"DRSNDSN keyword" on page 181	O	-	-	-	-	-	O	-
"DSBUF keyword" on page 181	O	-	-	-	O	O	O	-
"DSDALLOC keyword" on page 182	O	-	-	-	O	O	-	-
"DSN keyword" on page 183	O	-	-	-	-	-	O	-
"DSN2 keyword" on page 183	O	-	-	-	-	-	O	-
"DSNn keyword" on page 184 (*n*=3-7)	O	-	-	-	-	-	O	-
"DSNTYPE keyword" on page 184	O	O	O	O	-	O	O	-
"DSSTEMP keyword" on page 185	O	-	-	-	-	-	O	FASTIC
"DYNA_RETRY keyword" on page 185	O	-	-	-	-	-	O	DBDALLOC
"EMPOSAM keyword" on page 186	O	-	-	-	-	-	O	-
"EXPDT keyword" on page 187	O	O	O	O	-	O	-	-
"EXPDT2 keyword" on page 187	O	O	O	O	-	O	-	-
"EXPDTn keyword" on page 188 (*n*=3-7)	O	O	O	O	-	O	-	-
"EXTENT keyword" on page 189	O	-	-	-	O	-	O	-
"FALLBACK keyword" on page 189	O	-	-	-	-	-	O	BYPDBAUTH CIC_KSDS DBRC

Keyword	GLOBAL	GROUP	IC/AIC	CIC/ACIC	RCV	CRC	Site default option	Related keyword
"FASTIC keyword" on page 190	O	-	-	-	-	-	O	OFFLDSTACK OFFLDTYPE REGTIMESTMP
"FUNC keyword" on page 192	-	R	-	-	-	-	-	CAGRP DBDSGRP
"GDGBASE keyword" on page 193	O	-	-	-	-	-	O	-
"GDGLIMIT keyword" on page 193	O	-	-	-	-	-	O	GDGBASE
"GROUPDIGITS keyword" on page 194	O	-	-	-	-	-	O	HDPC
"GRPLIM keyword" on page 194	O	O	-	-	-	-	O	CAGRP DBDSGRP
"GSGNAME keyword" on page 195	O	-	-	-	-	-	-	-
"HDPC keyword" on page 196	O	O	O	O	-	-	O	-
"HOMECHK keyword" on page 198	O	O	O	O	-	-	O	HDPC
"HPIO keyword" on page 199	O	O	O	O	O	O	O	-
"ICBUF keyword" on page 200	O	O	O	O	-	O	O	-
"ICCAT keyword" on page 200	O	O	O	O	-	O	O	-
"ICDALLOC keyword" on page 201	O	O	O	O	-	O	O	-
"ICDUMP keyword" on page 202	-	-	-	-	O	O	-	-
"ICHLQ keyword" on page 202	O	O	O	O	-	O	O	-
"ICHLQ2 keyword" on page 204	O	O	O	O	-	O	O	-
"ICHLQn keyword" on page 205 (*n*=3-7)	O	O	O	O	-	O	O	-
"ICNMRULE keyword" on page 206	O	O	O	O	-	O	O	ICOUT
"ICOUT keyword" on page 207	O	O	O	O	-	O	O	-
"ICUNIT keyword" on page 209	O	O	-	-	O	O	O	IGNORCAT
"IC_ERROR keyword" on page 210	O	-	-	-	-	-	O	RETCDDSN SHDW_ERROR
"IDXSRCH keyword" on page 211	O	-	-	-	-	-	O	VIC
"IGNORCAT keyword" on page 211	O	-	-	-	-	-	O	CAUNIT ICUNIT LOGUNIT
"ITKBLOAD keyword" on page 212	O	-	-	-	-	-	O	ITKBSRVR
"ITKBSRVR keyword" on page 213	O	-	-	-	-	-	O	ITKBLOAD SENSOR TOIXCFGR
"IXKEYCHK keyword" on page 213	O	-	-	-	-	-	O	HDPC
"KEYLABEL keyword" on page 214	O	O	O	O	-	O	O	-
"LBI keyword" on page 215	O	-	-	-	-	-	-	-
"LOGUNIT keyword" on page 215	O	-	-	-	O	-	O	IGNORCAT
"LOGUSE keyword" on page 216	O	-	-	-	O	-	O	-
"MGMTCLAS keyword" on page 217	O	O	O	O	-	O	O	-
"MGMTCLAS2 keyword" on page 217	O	O	O	O	-	O	O	-
"MGMTCLASn keyword" on page 218 (*n*=3-7)	O	O	O	O	-	O	O	-
"MSGFREQ keyword" on page 219	O	O	O	O	-	-	O	-
"NOREUSE keyword" on page 219	O	-	-	-	-	-	O	DBRC ICDALLOC
"NOTIFY keyword" on page 220	O	O	-	-	-	O	O	DBRC
"NOTIFYMODE keyword" on page 221	O	-	-	-	-	-	O	DBRC DEDBPC HDPC RESTART
"OFFLDSTACK keyword" on page 223	O	O	O	O	-	-	O	FASTIC
"OFFLDTYPE keyword" on page 224	O	O	O	O	-	-	O	FASTIC
"PART keyword" on page 224	-	-	O	O	O	O	-	DBD
"RECALL keyword" on page 225	O	-	-	-	-	-	O	-
"REGTIMESTMP keyword" on page 226	O	-	-	-	-	-	O	FASTIC
"RESTART keyword" on page 227	O	-	-	-	-	-	O	-
"RETCDDSN keyword" on page 228	O	-	-	-	-	-	O	-
"RETPD keyword" on page 228	O	O	O	O	-	O	O	-
"RETPD2 keyword" on page 229	O	O	O	O	-	O	O	-
"RETPDn keyword" on page 230 (*n*=3-7)	O	O	O	O	-	O	O	-
"RSTTYPE keyword" on page 230	O	-	-	-	-	-	O	RESTART
"RSTTYPE_STK keyword" on page 231	O	-	-	-	-	-	O	RESTART RSTTYPE STACK

Keyword	GLOBAL	GROUP	IC/AIC	CIC/ACIC	RCV	CRC	Site default option	Related keyword
"SENSOR keyword" on page 232	O	-	-	-	-	-	O	ITKBSRVR TOIXCFGR
"SENSOR_HOME keyword" on page 233	O	-	-	-	-	-	O	HOMECHK SENSOR
"SHDWDELETE keyword" on page 234	O	-	-	-	-	-	O	FASTIC
"SHDWDSN keyword" on page 235	O	-	-	-	-	-	O	FASTIC SHDWHLQ
"SHDWHLQ keyword" on page 235	O	O	O	O	-	-	O	FASTIC SHDWDSN
"SHDWMGMTCL keyword" on page 236	O	O	O	O	-	-	O	FASTIC
"SHDWSTORCL keyword" on page 237	O	O	O	O	-	-	O	FASTIC
"SHDWTCTL keyword" on page 237	O	-	-	-	-	-	O	FASTIC
"SHDWVOLSER keyword" on page 238	O	O	O	O	-	-	-	FASTIC
"SHDW_ERROR keyword" on page 239	O	-	-	-	-	-	-	FASTIC
"SPACE keyword" on page 239	O	O	O	O	-	O	O	-
"SPMN keyword" on page 240	O	O	O	O	-	-	O	HDPC TOIXCFGR
"STACK keyword" on page 241	O	O	O	O	-	O	O	STACKBASE
"STACKBASE keyword" on page 243	O	-	-	-	-	-	O	STACK
"STORCLAS keyword" on page 244	O	O	O	O	-	O	O	-
"STORCLAS2 keyword" on page 244	O	O	O	O	-	O	O	-
"STORCLASn keyword" on page 245 (*n*=3-7)	O	O	O	O	-	O	O	-
"TASKCTL keyword" on page 246	O	-	-	-	-	-	O	GRPLIM
"THRESHOLDS keyword" on page 247	O	O	O	O	-	-	O	HDPC
"TIMECHK keyword" on page 249	O	-	-	-	O	O	O	-
"TIMESTMP keyword" on page 250	O	-	-	-	O	O	O (See Note)	-
"TOIAUTO keyword" on page 252	O	O	O	-	-	-	O	DBRC TOIXCFGR
"TOIAUTO_Q keyword" on page 255	O	-	-	-	-	-	O	DBRC TOIXCFGR
"TOIAUTO_STA keyword" on page 256	O	-	-	-	-	-	O	TOITIME
"TOIRETRY keyword" on page 257	O	-	-	-	-	-	O	TOIAUTO
"TOITIME keyword" on page 258	O	-	-	-	-	-	O	TOIAUTO
"TOITIME_Q keyword" on page 258	O	-	-	-	-	-	O	TOIAUTO_Q
"TOIXCFGR keyword" on page 259	O	-	-	-	-	-	O	SENSOR SPMN TOIAUTO TOIAUTO_Q
"TOIXCFGR keyword" on page 259 "TOSIXCFGRP keyword" on page 260	O	-	-	-	-	-	O	SENSOR SPMN TOIAUTO TOIAUTO_Q
"T2CHK keyword" on page 260	O	O	O	O	-	-	O	HDPC
"UNIT keyword" on page 261	O	O	O	O	-	O	O	-
"UNIT2 keyword" on page 261	O	O	O	O	-	O	-	-
"USER keyword" on page 262	O	-	-	-	-	-	O	HDPC
"VIC keyword" on page 263	O	O	O	O	-	-	O	DBRC HDPC NOTIFYMODE VICDSN
"VICDSN keyword" on page 264	O	O	-	-	-	-	O	VIC
"VOLCNT keyword" on page 264	O	O	O	O	-	O	O	-
"VOLSER keyword" on page 265	O	O	O	O	-	O	-	-
"VOLSER2 keyword" on page 266	O	O	O	O	-	O	-	-
"VOLSERn keyword" on page 266 (*n*=3-7)	O	O	O	O	-	O	-	-
"WAITALOC keyword" on page 267	O	-	-	-	-	-	O	-
"WAITMSG keyword" on page 268	O	-	-	-	-	-	O	WAITTIME
"WAITTIME keyword" on page 268	O	-	-	-	-	-	O	WAITMSG
"ZIIPMODE keyword" on page 269	O	-	-	-	-	-	O	-

Keyword	GLOBAL	GROUP	IC/AIC	CIC/ACIC	RCV	CRC	Site default option	Related keyword

Note: TIMESTMP=LASTIC | LASTICALL is available as the site default.

ADDN keyword

The ADDN keyword specifies the area data set DD name in the ADS list that is registered to the DBRC RECON data set.

Functions that support this keyword

Recovery function

Statements that support this keyword

RCV statement

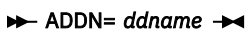
Site default option

Not supported

Related keyword

"AREA keyword" on page 163

Format



ddname

The area data set DD name in the ADS list registered to the DBRC RECON data set.

Default value

None.

ADXCFGRP keyword

The ADXCFGRP keyword specifies the Autonomics Director XCF group name. The name is used to send a sensor data notification to Autonomics Director when the sensor data is stored in the Sensor Data repository of IMS Tools KB.

The notification is needed to Autonomics Director to schedule a follow-on action of evaluating sensor record. Therefore, consider specifying the Autonomics Director XCF group name when you specify SENSOR=Y.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

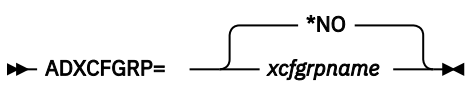
Site default option

Supported

Related keywords

- "ITKBSRVR keyword" on page 213
- "SENSOR keyword" on page 232
- "TOIXCFGR keyword" on page 259

Format



xcfgrpname

Specify the Autonomics Director XCF group name.

***NO**

A sensor data notification is not sent to Autonomics Director.

Default value

ADXCFGRP=*NO

Usage notes

- If you specify the Autonomics Director XCF group name, you must also specify DBRC=YES.
- If the SENSOR keyword does not specify Y, ADXCFGRP=*xcfgrpname* is ignored.
- When you use the DB Sensor function to collect sensor data from a full-function database, certain considerations apply to the collected data element values. For details, see the topic "Considerations for collecting sensor data from full-function databases" in the *IMS Solution Packs Data Sensor User's Guide*.

AREA keyword

The AREA keyword specifies the names of areas in the database to be processed. The AREA keyword is applicable only to DEDBs.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

- IC/AIC statement
- CIC/ACIC statement
- RCV statement
- CRC statement

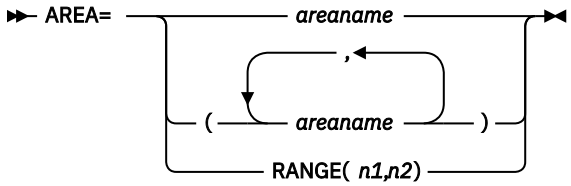
Site default option

Not supported

Related keyword

"DBD keyword" on page 175

Format



areaname

The name of an area in the database. *areaname* can be specified with wildcard characters. Wildcard characters supported are asterisk (*) and percent (%) symbol. An asterisk (*) represents 0 - 8 characters, whereas a percent (%) symbol represents a single character. For example, AREA=area* matches area, area1, area1234, and so on. If two or more asterisks (*) are specified in sequence, only the first asterisk is recognized. The specification by using wildcard characters cannot be used for the RCV control statement.

(*areaname1*,*areaname2*,...)

A list of target areas in the database. Area names in the list can also be specified with wildcard characters. You can specify up to 2048 area names in the list. All areas specified in the list must exist at run time. The list form cannot be used for the RCV control statement.
To process more than 2048 areas, use wildcard characters or the RANGE parameter.

RANGE(*n1*,*n2*)

The range of area numbers of the target areas in the database. *n1* and *n2* are area numbers, which are sequential decimal numbers assigned to the areas in a database. *n1* and *n2* can be in the range of 1 - 9999. *n2* must be equal to or greater than *n1*. At least one area must exist in the specified range. The range format cannot be used for the RCV control statement.

Default value

None.

How duplicate specification is processed

If there are duplicate areas selected in the list format (*areaname1*,*areaname2*,...), areas are prioritized in the following order, and duplication is eliminated:

1. Areas selected by *areaname* without wildcard characters
2. Areas selected by *areaname* with wildcard characters

If duplicate areas are of the same priority, the area that is selected earlier is higher in priority.

If there are duplicate areas selected over multiple ICEIN statements, areas are prioritized in the following order, and duplication is eliminated:

1. Areas selected by no AREA parameter, areas selected by *areaname* without wildcard characters, or areas selected by the GROUP statement
2. Areas selected by RANGE(*n1*,*n2*)
3. Areas selected by *areaname* with wildcard characters

If duplicate areas are of the same priority, except for the first case (no AREA parameter), the area that is selected earlier is higher in priority. If duplicate areas are of the first case, duplication is not eliminated.

BYPDBAUTH keyword

The BYPDBAUTH keyword specifies to bypass DBRC database authorization for index databases. This keyword is effective only when both VIC=Y and HDPC=N are specified.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

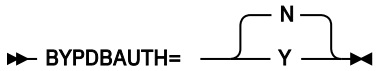
Site default option

Supported

Related keywords

- “DBDALLOC keyword” on page 176
- “DBRC keyword” on page 178
- “HDPC keyword” on page 196
- “TOIAUTO keyword” on page 252
- “TOIAUTO_Q keyword” on page 255
- “VIC keyword” on page 263

Format



Y

Bypasses the following processes:

- DBRC database authorization process
- Dynamic allocation process to allocate index database data sets
- IMS command process (even when TOIAUTO=Y or TOIAUTO_Q=Y is specified)

N

Requests DBRC database authorization, allocates index database data sets dynamically, and processes IMS commands.

Default value

BYPDBAUTH=N

Usage note

BYPDBAUTH=Y is ignored if HDPC=Y, HDPC=O, or VIC=N is specified.

CAGRP keyword

The CAGRP keyword specifies the name of the change accumulation group (CA group) that is registered to the DBRC RECON data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GROUP statement

> **Note:** Either the CAGRP or the DBDSGRP keyword is required for the GROUP statement.

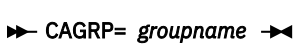
Site default option

Not supported

Related keyword

"FUNC keyword" on page 192

Format



groupname

The name of the change accumulation group. All DBDSs that are defined in the change accumulation group are processed by the Image Copy function.

Default value

None.

CAUNIT keyword

The CAUNIT keyword specifies the unit name where the input change accumulation data set resides.

Functions that support this keyword

Recovery function

Statements that support this keyword

- GLOBAL statement
- RCV statement

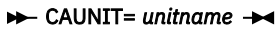
Site default option

Supported

Related keyword

"IGNORCAT keyword" on page 211

Format



unitname

The unit name of the input change accumulation data set for dynamic allocation.
The following table shows how the Recovery function handles the unit parameter for dynamic allocation.

Table 90: How Recovery function handles the unit parameter

Specification of CAUNIT	DBRC status is CATDS and input CA is cataloged	DBRC status is CATDS and input CA is not cataloged	DBRC status is NOCATDS
CAUNIT=*unitname*	Ignore CAUNIT. Use catalog information.	Use CAUNIT.	Use CAUNIT.
Omit CAUNIT	Use catalog information.	Use the unit name in the CA record in DBRC.	Use the unit name in the CA record in DBRC.

Default value

None.

CIC_KSDS keyword

The CIC_KSDS keyword specifies whether the concurrent image copy process creates image copy data sets when the processed data sets are key-sequenced data sets (KSDS). This keyword is ignored if the concurrent image copy process is requested with Advanced Image Copy Services.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

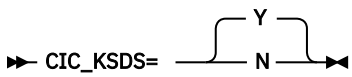
Site default option

Supported

Related keywords

None.

Format



Y

Creates image copy data sets of KSDS database data sets. These image copies can be used for data pointer checking or for user-specific purposes.

N

Does not create image copy data sets of KSDS database data sets.

Default value

CIC_KSDS=Y

Usage notes

- Specify CIC_KSDS=N if you want to prevent image copy data sets of KSDS database data sets from being created. The IMS HP Image Copy job ends with return code 8. When either VIC=Y or HDPC=O is specified, the virtual image copy process or HASH pointer check runs for the index database.
- The CIC_KSDS keyword is effective for the concurrent image copy process when Advanced Image Copy Services is not used (FASTIC=N or no FASTIC keyword).
- The image copy data sets of KSDS database data sets that are created when CIC_KSDS=Y cannot be used for recovering index databases.
- If you want to apply the concurrent image copy process to create image copy data sets for recovering KSDS databases, consider using FASTIC=(,DUMP) processing of Advanced Image Copy Services.

COMP keyword

The COMP keyword specifies whether to compress output image copy data.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

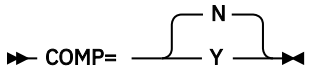
Site default option

Supported

Related keywords

- “COMPMODE keyword” on page 167
- “COMPRTN keyword” on page 169
- “CRCTYPE keyword” on page 170

Format



Y

Output image copy data is compressed.

N

Output image copy data is not compressed.

Default value

COMP=N

Usage note

Certain considerations apply to the use of the COMP keyword for the Create Image Copy function. See “Logical copy and physical copy” on page 127.

COMPMODE keyword

The COMPMODE keyword controls the priority of the compression methods for compressing the output image copy data sets. This keyword is effective only when the IDRC feature is activated by the JCL or the system.

The compression methods are determined based on the specifications of the COMP keyword and the COMPRTN keyword. The following table summarizes the IMS HP Image Copy compression features that are applied by each combination of the COMPMODE, COMP, and COMPRTN specifications.

Table 91: Compression features applied by the combination of compression keywords

COMPMODE=	COMP=	COMPRTN=	Applied compression feature
N	N	N/A	IDRC compression
N	Y	FABJCMP2	Software compression and IDRC compression
N	Y	FABJCMP1, FABJCMP3, or FABJCMP4	IDRC compression
COND	N	N/A	IDRC compression
COND	Y	FABJCMP2	Software compression and IDRC compression
COND	Y	FABJCMP1, FABJCMP3, or FABJCMP4	Software compression

Notes:

- Whether the IDRC feature is activated depends on the z/OS® system definition and on the TRTCH subparameter of the DCB parameter in the output image copy data set DD statement.
- If the IDRC feature is activated for the primary image copy data set, the compression routine is ignored for the other image copies that are taken from the same database data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

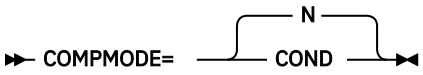
Site default option

Supported

Related keywords

- “COMP keyword” on page 167
- “COMPRTN keyword” on page 169

Format



COND

If the IDRC feature is active and the compression routine is not FABJCMP2, IMS HP Image Copy automatically turns off IDRC and uses the software compression.

N

If the IDRC feature is active and the compression routine is not FABJCMP2, IMS HP Image Copy automatically turns off the software compression and uses IDRC.

Default value

COMPMODE=N

COMPRTN keyword

The COMPRTN keyword specifies the name of the compression routine that IMS HP Image Copy invokes to compress output image copy data.

This keyword is effective when COMP=Y is specified.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

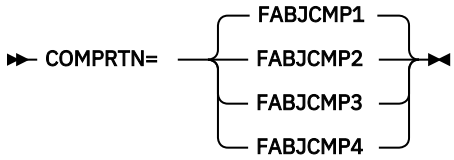
Site default option

Supported

Related keywords

- "COMP keyword" on page 167
- "COMPMODE keyword" on page 167

Format



FABJCMP1

FABJCMP2

FABJCMP3

FABJCMP4

The name of the compression routine. IMS HP Image Copy provides four compression exit routines: FABJCMP1, FABJCMP2, FABJCMP3, and FABJCMP4. Specify one of these compression routines to be called by the Image Copy function or the Create Image Copy function.
If the COMP=Y keyword is specified without the COMPRTN keyword, FABJCMP1 is used as the default.

The same compression routine is automatically called in Recovery function jobs to decompress the compressed data.

The following table summarizes the compression routines.

Table 92: Compression routines of IMS HP Image Copy

Compression routine	Compression algorithm
FABJCMP1	Runs repeated character compression. Free space can also be compressed.
FABJCMP2	Runs only free space compression. Segmented data is not compressed.
FABJCMP3	Runs repeating-characters compression of the z/OS® program compression method. Free space might also be compressed.

Compression routine	Compression algorithm
FABJCMP4	Runs the repeating-characters compression of the z/OS® program compression method. This routine runs the block compression, which does not distinguish between the data portion, free space, and unused space in the database.

Default value

FABJCMP1

> **Note:** The default value for the COMPRTN keyword under IMS Database Reorganization Expert is FABJCMP3.

Usage notes

- If you want to create a compressed image copy data set for a DEDB that has SDEP segments, you must use FABJCMP4. FABJCMP1, FABCMP2, and FABJCMP3 cannot be used for a DEDB that has SDEP segments.
- If the IDRC feature is installed and is active on the native tape drive, software compression is suppressed for the IC1, IC2, or both output data sets except when FABJCMP2.
- If you want to use the software compression for the tape device on which the IDRC feature is active, specify the COMPMODE keyword to deactivate IDRC.

CRCTYPE keyword

The CRCTYPE keyword specifies whether the Create Image Copy function creates a physical copy or a logical copy of each input data set.

Functions that support this keyword

Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- CRC statement

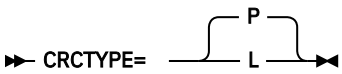
Site default option

Supported

Related keyword

"COMP keyword" on page 167

Format



L

Creates a logical copy of the input data set. A logical copy can be a data set whose compression routine is different from the compression routine that is used for the input data set.
If the input data set is in Fast Recovery image copy format, the logical copy changes the format to the standard image copy format of IMS HP Image Copy. CRCTYPE=L and DBRC=Y are required to change the format from the Fast Recovery image copy to the standard image copy format of IMS HP Image Copy, and the input image copy data set must be registered to DBRC.

P

Creates a physical copy of the input data set. A physical copy is the same data set as the input data set.

Default value

CRCTYPE=P

Usage note

Certain considerations apply to using the CRCTYPE keyword with the COMP keyword for the Create Image Copy function. See "Logical copy and physical copy" on page 127.

DATACLAS keyword

The DATACLAS keyword specifies the name of the data class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

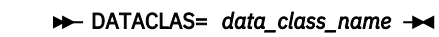
Site default option

Supported

Related keyword

None.

Format



data_class_name

The name of the data class for allocating the data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

The DATACLAS keyword is not effective when you use Advanced Image Copy Services (FASTIC keyword) and dynamic allocation.

DATACLAS2 keyword

The DATACLAS2 keyword specifies the name of the data class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

- CRC statement

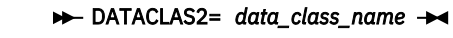
Site default option

Supported

Related keyword

None.

Format



data_class_name

The name of the data class for allocating the data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

The DATACLAS2 keyword is not effective when you use Advanced Image Copy Services (FASTIC keyword) and dynamic allocation.

DATACLAS*n* keyword

The DATACLAS*n* keyword specifies the name of the data class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

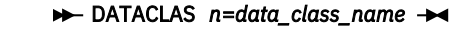
Site default option

Supported

Related keyword

None.

Format



n

Use DATACLAS*n* to specify the data class for the *n*th image copy data set. *n* is 3 through 7. For example, use DATACLAS5 to specify the data class for the fifth image copy data set.

data_class_name

The name of the data class for allocating the data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

The DATACLAS*n* keyword is not effective when you use the Advanced Image Copy Services (FASTIC keyword) and dynamic allocation.

DATA_MOVER keyword

The DATA_MOVER keyword defines the data mover utility for Advanced Image Copy Services.

This keyword is applicable to the following processes:

- FDUMP and COPY processes of Advanced Image Copy Services.
- Physical copy process (CRCTYPE=P) of the Create Image Copy function, when the format of input image copy data set is Fast Recovery image copy.
- Recovery function, when the format of input image copy data set is Fast Recovery image copy.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement

Site default option

Supported

Related keyword

“FASTIC keyword” on page 190

Format

ADRDSSU

Uses DFSMSdss for the processes of Advanced Image Copy Services. ADRDSSU is the default value. If both the input database data set and the output image copy data set use EMC DASD, specifying DATA_MOVER=ADRDSSU causes the IMS HP Image Copy job to end with an error.

EMCSNAP

Uses EMC TimeFinder for the Advanced Image Copy Services process. EMC TimeFinder creates a snap copy of the data set.
EMC TimeFinder must be set up to use this option. Otherwise, the job ends with an error.

Default value

DATA_MOVER=ADRDSSU

DBALL keyword

The DBALL keyword specifies to search logical group DBDSs automatically.

Term *logical group* is a unique-term that is used in IMS HP Image Copy information. A logical group refers to a group of databases that have logical relationships between the databases and their related index databases.

The DBALL keyword does not support DEDBs and Fast Path secondary indexes.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

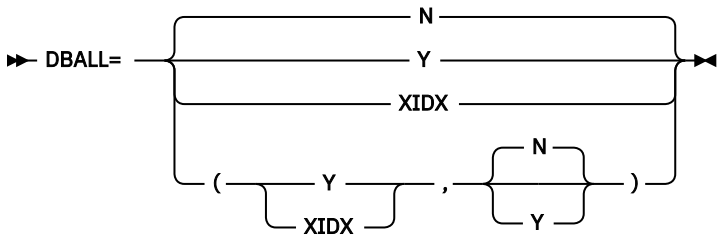
Site default option

Supported

Related keyword

None.

Format



First operand

Y

Searches the logical group DBDSs from the DBD and processes the identified DBDSs.

XIDX

Searches and processes the DBDSs that are logically related with each other. Their related index databases are not searched or not processed.

N

Does not search the logical group DBDSs.

Second operand

If you omit the second operand, N is used as the default.

N

Specifies that the time stamps of IC data sets for logically related databases are not the same.

Y

Specifies that the time stamps of IC data sets for logically related databases are the same.

Default value

DBALL=N

Usage notes

- To search all DBDSs, including logically related databases, IMS HP Pointer Checker is required.
- When ICOUT=*ddname* is specified, DBALL=Y or DBALL=XIDX is ignored for that statement. However, when ICOUT=*ddname*, DBALL=Y, and VIC=Y are specified, IMS HP Image Copy searches for index databases that have logical relationships with the specified database, and creates a virtual image copy for the index databases.
- For the optional parameter for the auto-searched DBDS, the first DBDS optional parameter that is specified for ICEIN in the same logical group is used.
- If you specify DBALL=(N,Y) on the GLOBAL statement, IMS HP Image Copy ends with a return code of 16 with a DBALL operand error.
- If you specify DBDALLOC=N with DBALL=Y or DBALL=XIDX on the ICEIN statement, DBALL=Y or DBALL=XIDX is ignored.
- When DBALL=XIDX and IDXSRCH=Y are specified, the Image Copy function processes DBDSs in the following order:
  a. Searches for the related primary and secondary index DBDSs from the DBD (IDXSRCH=Y specification).
  b. Searches for the DBDSs that have logical relationships with each other (DBALL=XIDX specification).

DBBUF keyword

The DBBUF keyword specifies the number of buffers to be used to access the database data set groups or areas.

For HALDB, HDAM, HIDAM database data sets, and DEDBs, if the High Performance Input/Output interface (HPIO) or Advanced Image Copy Services (FASTIC) is used, the DBBUF keyword is ignored.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- RCV statement

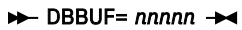
Site default option

Supported

Related keyword

None.

Format



nnnnn

The left-aligned number of buffers used to access the database data set groups or areas. Specify a value in the range of 0 - 32767. A value of 0 specifies that IMS HP Image Copy calculate and apply the optimal value.
When the access method of the database data set is OSAM and the specified value is greater than 255, IMS HP Image Copy uses 255 for the OSAM data set.

Default value

None.

Usage note

If the keyword is omitted, IMS HP Image Copy accesses the database data set with the optimized number of buffers. For more information about how IMS HP Image Copy determines the optimal value, see the following topics:

- "Tuning the image copy process" on page 385
- "Tuning the recovery process" on page 387

DBD keyword

The DBD keyword specifies the name of the DBD to be processed.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

The DBD keyword is required in the following statements:

- IC/AIC statement
- CIC/ACIC statement
- RCV statement
- CRC statement

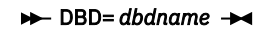
Site default option

Not supported

Related keyword

None.

Format



dbdname

The name of the DBD that includes the data sets to process. To process a HALDB, specify the master DBD name.
For the Image Copy function, *dbdbname* can be specified with wildcard characters. Wildcard characters supported are asterisk (*) and percent (%) symbol. These wildcard characters cannot be used at the beginning of *dbdname*. An asterisk (*) represents 0 - 7 characters, whereas a percent (%) symbol represents a single character. For example, `DBD=dbd*` matches dbd, dbd1, dbd12345, and so on. If two or more asterisks (*) are specified in sequence, only the first asterisk is recognized.

When you use wildcard characters for the DBD keyword, the following considerations apply:

- Wildcard characters cannot be used for the DBD keyword when the DBD keyword is used in a CRC or RCV control statement.
- DBRC=Y must be specified.
- DDN or AREA keyword must not be specified.

Default value

None.

DBDALLOC keyword

The DBDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates data sets of DL/I database, HALDB, or DEDB areas.

Functions that support this keyword

- Image Copy function
- Recovery function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- RCV statement

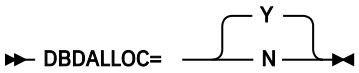
Site default option

Not supported

Related keyword

None.

Format



Y

Specifies that the Image Copy function or the Recovery function dynamically allocates data set of the DL/I database, HALDB, or DEDB areas if no DD statement is supplied in the JCL.

N

Specifies that the Image Copy function or the Recovery function uses the JCL specification to allocate data set or areas.

Default value

DBDALLOC=Y

DBDSGRP keyword

The DBDSGRP keyword specifies the name of the database data set group (DBDS) that is registered to the DBRC RECON data set.

The name of the following group types can be specified:

- DBDS group
- DB group
- Recovery group

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GROUP statement

> **Note:** Either the CAGRP or the DBDSGRP keyword is required for the GROUP statement.

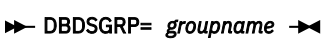
Site default option

Not supported

Related keyword

"FUNC keyword" on page 192

Format



groupname

The name of the group. All database data sets defined in the group are processed by the Image Copy function.

Default value

None.

Usage note

The following considerations apply when you specify a DB group name for the DBDSGRP keyword:

- A DB group must indicate the DBD name or the partition name of HALDB registered to DBRC.
- When a DB group specifies an AREA name, IMS HP Image Copy ignores it.

DBRC keyword

The DBRC keyword specifies to override the specification of DBRC in the IMSCTRL macro statement that is specified during IMS system definition.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

Site default option

Supported

Related keyword

None.

Format

Y

Uses DBRC during the execution of IMS HP Image Copy.

N

Does not use DBRC.

Default value

DBRC=Y

Usage note

If the target area of the DEDB is used by another application that has update authorization during the CIC processing with DEDB HASH Check turned on, the report that the HASH Check generates might not be certified.

DDN keyword

The DDN keyword specifies the database data set (DBDS) DD name. This keyword is applicable only to full-function databases.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

- IC/AIC statement
- CIC/ACIC statement
- RCV statement
- CRC statement

Site default option

Not supported

Related keyword

"DBD keyword" on page 175

Format

ddname

The database data set (DBDS) DD name.

Default value

None.

DEDBPC keyword

The DEDBPC keyword enables the HASH Check option of the DEDB Pointer Checker utility.

This keyword is effective when the executing function is batch image copy or concurrent image copy.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

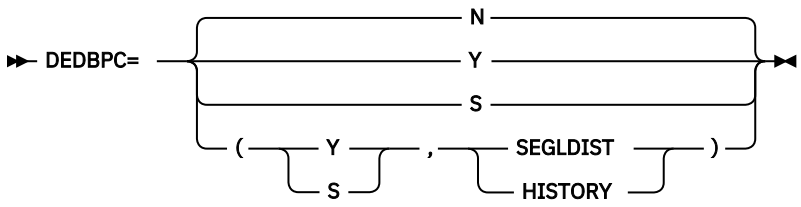
Site default option

Supported

Related keyword

None.

Format



Y

Enables the DEDB HASH pointer check option.

N

Does not enable the DEDB HASH pointer check option.

S

Enables the DEDB HASH pointer check option. SSP pointers are also evaluated during DEDB HASH pointer check.

SEGLDIST

Requests the DEDB Pointer Checker utility to print the Segment Length Distribution report. For more information about this report, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

HISTORY

Requests to update the HISTORY data set of the database data sets to analyze. If the HISTORY option is specified, the HISTORY data set is required.
For details about the HISTORY option, see the *IMS Fast Path Solution Pack IMS Supplementary Utilities User's Guide*.

> **Note:** To enable the HISTORY option, APAR PH30776 must be applied to IMS HP Image Copy and APAR PH28270 must be applied to IMS Fast Path Solution Pack.

Default value

DEDBPC=N

Usage note

If the target area of the DEDB is updated by another application during the CIC processing with DEDB HASH Check turned on, the report that the HASH Check generates might not reflect the actual DEDB status.

DEL_ICDS keyword

The DEL_ICDS keyword specifies the image copy data set of the database data set be deleted when an error occurs in the image copy process of the database data set.

This keyword is effective for image copy data sets that are allocated dynamically by the Image Copy function.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

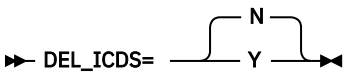
Site default option

Supported

Related keywords

- “DBRC keyword” on page 178
- “ICDALLOC keyword” on page 201
- “NOTIFYMODE keyword” on page 221
- “RESTART keyword” on page 227
- “RSTTYPE keyword” on page 230
- “RSTTYPE_STK keyword” on page 231
- “VIC keyword” on page 263

Format



Y

Deletes the dynamically allocated image copy data set when an error occurs in the image copy process of the database data set.
If the Image Copy function runs with DBRC=Y and the database data set is registered to the DBRC RECON data sets, the IC record in the DBRC RECON data sets is also deleted.

If the image copy data set is created on a tape volume, that image copy data set is not deleted even when DEL_ICDS=Y is specified. But that image copy data set will be uncataloged and the IC record in the DBRC RECON data sets will be deleted.

N

Does not delete the image copy data set even when an error occurs in the image copy process of the database data set.
If the IC record is already registered to the DBRC RECON data sets, the IC record is not deleted.

Default value

DEL_ICDS=N

Usage note

Even when DEL_ICDS=Y is specified, image copy data sets are not deleted when one of the following conditions is met:

- The image copy data set is defined by a DD statement in the JCL stream.
- The image copy data set is allocated outside of the IMS HP Image Copy process.
- The image copy data set is on a tape volume.

The IC record in the DBRC RECON data sets is deleted even if these conditions are met.

DRSNDSN keyword

The DRSNDSN keyword specifies the name of the data set that contains FABJDRSN control statements, which define the error reason codes and SMS reason codes of dynamic allocation.

If you specify this keyword, IMS HP Image Copy attempts to allocate the data set dynamically.

For more information about FABJDRSN control statements, see "FABJDRSN control statement" on page 272.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

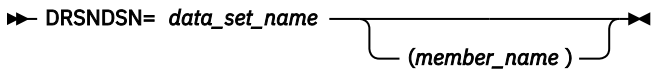
Site default option

Supported

Related keyword

None.

Format



data_set_name

Specifies the name of the data set that contains the FABJDRSN control statements.

member_name

If you specify the FABJDRSN control statements in a partitioned data set member, you must specify the member name.
IMS HP Image Copy considers the data set as a sequential file unless you specify a member name.

Default value

None.

DSBUF keyword

The DSBUF keyword specifies the number of buffers to be used to access the input data set.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement

- RCV statement
- CRC statement

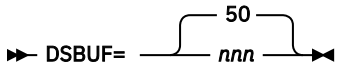
Site default option

Supported

Related keyword

None.

Format



nnn

The left-aligned number of buffers used to access the input image copy data set, the log data set, and the change accumulation data set. Specify the value in the range of 0 - 255.

Default value

The default value is 50.

DSDALLOC keyword

The DSDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates the input data set.

Functions that support this keyword

- Recovery function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- RCV statement
- CRC statement

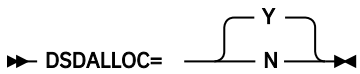
Site default option

Not supported

Related keyword

None.

Format



Y

Allocates the input data set dynamically if no corresponding DD statement is supplied in the JCL.

The following table shows the relation between the type of dynamically allocated input data sets, the DD statement that can be omitted, and the functions that support DSDALLOC=Y.

Table 93: Dynamically allocated input data sets

Data set to be dynamically allocated	DD statement that can be omitted	Valid function
Input image copy data set for the Recovery function	DFSUDUMP DD statement	Recovery function
Input image copy data set for the Create Image Copy function	*ic-ddname* DD statement	Create Image Copy function
Input log data set	DFSULOG DD statement	Recovery function
Input change accumulation data set	DFSUCUM DD statement	Recovery function

N

Uses the JCL specification to allocate the input data set.

Default value

DSDALLOC=Y

DSN keyword

The DSN keyword specifies the data set naming template for the primary image copy data set that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

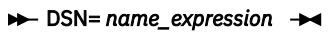
Site default option

Supported

Related keyword

None.

Format



name_expression

Specifies the template for the name of the image copy data set. You can specify a data set name by using symbolic variables, or non-variable alphanumeric or national characters ($ # @). Each symbolic variable is replaced with its related value at run time to form a specific data set name. When used in a DSN expression, a substitution variable begins with an ampersand sign (&) and ends with a period (.). The data set name generated must contain no more than 44 characters. For details, see "Data set naming template" on page 283.

Default value

None.

DSN2 keyword

The DSN2 keyword specifies the data set naming template for the secondary image copy data set that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

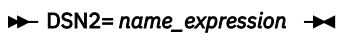
Site default option

Supported

Related keyword

None.

Format



name_expression

Specifies the template for the name of the image copy data set. You can specify a data set name by using symbolic variables or non-variable alphanumeric or national characters ($ # @). Each symbolic variable is replaced with its related value at run time to form a specific data set name. When used in a DSN expression, a substitution variable begins with an ampersand sign (&) and ends with a period (.). The data set name generated must contain no more than 44 characters. For details, see "Data set naming template" on page 283.

Default value

None.

DSN*n* keyword

The DSN*n* keyword specifies the data set naming template for the third to seventh image copy data sets that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

Site default option

Supported

Related keyword

None.

Format

n

Use DSN*n* to specify the naming template for the *n*th image copy data set. *n* is 3 through 7. For example, use DSN5 to specify the naming template for the fifth image copy data set.

name_expression

Specifies the naming template for the image copy data sets. You can specify a data set name by using symbolic variables or non-variable alphanumeric or national characters ($ # @). Each symbolic variable is replaced with its related value at run time to form a specific data set name. When used in a DSN expression, substitution variable begins with an ampersand sign (&) and ends with a period (.). The data set name generated must contain no more than 44 characters. For details, see "Data set naming template" on page 283.

Default value

None.

DSNTYPE keyword

The DSNTYPE keyword specifies whether IMS HP Image Copy allocates large format data sets or basic format data sets for output image copy data sets.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

- CRC statement

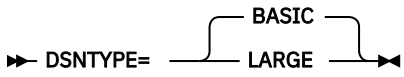
Site default option

Supported

Related keyword

None.

Format



LARGE

Allocates image copy data sets as large format data sets.
For more information about large format data sets, see *z/OS® DFSMS™ Using Data Sets*.

BASIC

Allocates image copy data sets as basic format data sets.

Default value

DSNTYPE=BASIC

DSSTEMP keyword

The DSSTEMP keyword specifies the name of the ICEFICO data set. The ICEFICO data set specifies the allocation information for the work data set used in FASTIC=(,DUMP) processing.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

Site default option

Supported

Related keyword

"FASTIC keyword" on page 190

Format

dsn

The data set name that provides the allocation attributes for the work data set for the FASTIC=(,DUMP) process.

Default value

None.

DYNA_RETRY keyword

The DYNA_RETRY keyword specifies whether IMS HP Image Copy retries to allocate database data sets dynamically when dynamic allocation fails due to database data sets already being allocated by another application with DISP=OLD.

The keyword also specifies the maximum number of retries and the retry interval.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

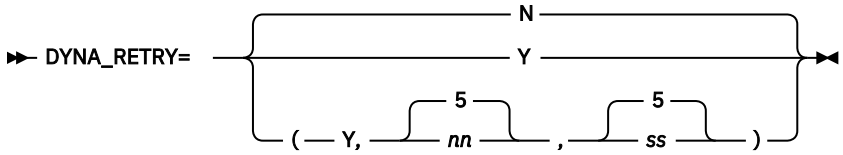
Site default option

Supported

Related keyword

"DBDALLOC keyword" on page 176

Format



When you specify Y, you can omit *nn* and *ss* parameters as follows:

- DYNA_RETRY=(Y,*nn*)
- DYNA_RETRY=(Y,,*ss*)

Y

Retries dynamic allocation of database data sets.

N

Does not retry dynamic allocation of database data sets.

nn

Specifies the maximum number of retries in the range of 1 - 99. This value is effective when the first operand is Y. If you do not specify the maximum number of retries, the maximum number of retries is set to 5.

ss

Specifies the number of seconds, in the range of 1 - 99, to wait before IMS HP Image Copy retries dynamic allocation. This value is effective when the first operand is Y. If you do not specify this value, the retry interval is set to 5 seconds.

Default value

If DYNA_RETRY is not specified, the default value is DYNA_RETRY=N.
If DYNA_RETRY=Y is specified, the default value is DYNA_RETRY=(Y,5,5).

EMPOSAM keyword

The EMPOSAM keyword specifies whether IMS HP Image Copy creates image copy data sets of the OSAM database that is not formatted.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

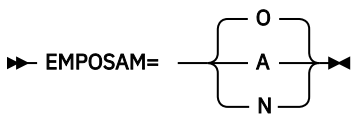
Site default option

Supported

Related keyword

None.

Format



O

Creates image copy data sets of unformatted OSAM database data sets in the DSG except for primary data sets.

A

Creates image copy data set of unformatted OSAM database data sets. EMPOSAM=A includes primary data sets.

N

Does not create image copy data sets when the input OSAM database is empty.

Default value

EMPOSAM=O

EXPDT keyword

The EXPDT keyword specifies the expiration date for the output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

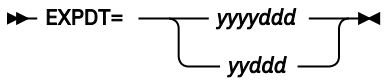
Site default option

Not supported

Related keyword

None.

Format



yyyyddd

yyddd

The expiration date of the output image copy. The date format must comply with the DFSMS™ format (the Julian calendar format).

Default value

None.

Usage notes

- If you specify FASTIC=(,COPY), this keyword is ignored.
- The EXPDT keyword and the RETPD keyword are mutually exclusive in a statement.

EXPDT2 keyword

The EXPDT2 keyword specifies the expiration date for the secondary output image copy data set.

Functions that support this keyword

- Image Copy function

- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

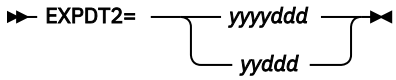
Site default option

Not supported

Related keyword

None.

Format



yyyyddd

yyddd

The expiration date of the output image copy. The date format must comply with the DFSMS™ format (the Julian calendar format).

Default value

None.

EXPDT*n* keyword

The EXPDT*n* keyword specifies the expiration dates for the third to seventh output image copy data sets.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

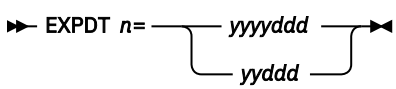
Site default option

Not supported

Related keyword

None.

Format



n

Use EXPDT*n* to specify the expiration date for the *n*th output image copy. *n* is 3 through 7. For example, use EXPDT5 to specify the expiration date for the fifth image copy data set.

yyyyddd

yyddd

The expiration date of the output image copy. The date format must comply with the DFSMS format (the Julian calendar format).

Default value

None.

EXTENT keyword

The EXTENT keyword specifies the maximum number for OSAM data set extents. This number is used to check the extent number of the OSAM data set after the data set is recovered.

If the extent number is greater than the number that you specified for the EXTENT keyword, the Recovery function ends with a return code of 16.

Functions that support this keyword

Recovery function

Statements that support this keyword

- GLOBAL statement
- RCV statement

Site default option

Supported

Related keyword

None.

Format

nnn

Specifies the maximum number of extents for the OSAM data set.

Default value

EXTENT=52

FALLBACK keyword

The FALLBACK keyword internally switches the batch image copy process to the concurrent image copy process when exclusive authorization of the input database is not granted during the batch image copy process.

This keyword is effective for the Image Copy function when the requested process is batch image copy and the process runs with DBRC=Y.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

Site default option

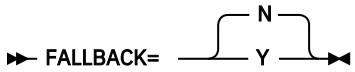
Supported

Related keywords

- “BYPDBAUTH keyword” on page 164

- “CIC_KSDS keyword” on page 166
- “DBRC keyword” on page 178

Format



Y

Switches the batch image copy process to the concurrent image copy process when exclusive authorization of the input database is not granted during the batch image copy process.

N

Does not switch image copy processes.

Default value

FALLBACK=N

Usage notes

- Even when FALLBACK=Y is specified, the process is not switched to the concurrent image copy process when one of the following conditions applies to the input database:
  - The database is not registered to the DBRC RECON data sets.
  - The database is a non-recoverable database.
  - The data set organization type is VSAM KSDS and FASTIC=(,COPY) or FASTIC=(,FDUMP) processing of Advance Image Copy Services is requested.
  - When FASTIC=(,DUMP) processing of Advance Image Copy Services is requested and the data set organization type is VSAM KSDS that does not satisfy both of the following conditions:
    - The data set is an SMS-managed data set
    - The BWO(TYPEIMS) parameter is not specified for the AMS DEFINE or the ALTER command for the data set
- FALLBACK=Y is not effective under the following conditions:
  - DBRC=N is specified.
  - The requested process is concurrent image copy.
  - The data set organization type is VSAM KSDS and the process runs with CIC_KSDS=N and FASTIC=N.
  - The input database is an index database and BYPDBAUTH=Y is specified.
- If FALLBACK=N and exclusive authorization is not granted during the batch image copy process, the IMS HP Image Copy job behaves as follows:
  - For full-function databases and HALDBs, IMS HP Image Copy ends abnormally.
  - For Fast Path databases, IMS HP Image Copy skips the area and continues with the next area. The job-step return code is set to 8.

FASTIC keyword

The FASTIC keyword enables Advanced Image Copy Services (using the DFSMSdss™ API) for creating image copies.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

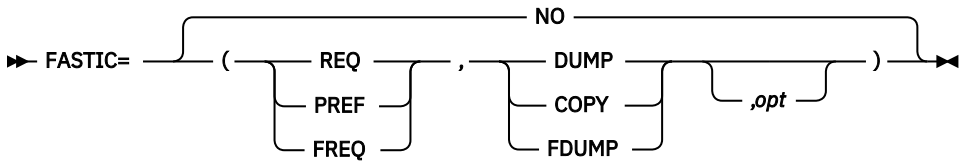
Site default option

Supported

Related keyword

- “OFFLDSTACK keyword” on page 223
- “OFFLDTYPE keyword” on page 224
- “REGTIMESTMP keyword” on page 226

Format



NO (or N)

Specifies that Advanced Image Copy Services is not used.

First operand:

REQ

Specifies that the use of Advanced Image Copy Services is required. If no services are available, then the image copy processing fails.

PREF

Specifies that the use of Advanced Image Copy Services is preferred. If any are available, then they are used. If no services are available, image copy processing continues.

FREQ

Specifies that either FlashCopy® or SnapShot Copy must be used. If neither FlashCopy® nor SnapShot Copy is used, IMS HP Image Copy fails the operation. DFSMSdss™ issues an informational message regarding why a fast replication method cannot be used. This option cannot be specified with the second operand DUMP.

Second operand:

DUMP

Specifies to use the DFSMSdss™ DUMP command in creating image copy. The output image copy is a standard format image copy of IMS HP Image Copy.

COPY

Specifies to use the DFSMSdss™ COPY command in creating the image copy. The output image copy is a Fast Recovery image copy.

FDUMP

Specifies to use the DFSMSdss™ COPY command in creating shadow data set from original database data set. The output image copy is created from the shadow data set as a standard format image copy of IMS HP Image Copy.

The following optional parameter is effective unless the first operand is N or NO:

opt

FCTOPPRCP | FCTOPPRCP (*suboption*)

Specifies the DFSMSdss™ FCTOPPRCPrimary option for the DFSMSdss™ COPY command. For details, see the description of the FCTOPPRCPrimary keyword in the *z/OS® DFSMSdss Storage Administration*.

> **Note:** The FCTOPPRCP option is effective only when it is specified for FASTIC=(,COPY) processing.

For more information about the FCTOPPRCP option, see the topic about FCTOPPRCPrimary in *z/OS® DFSMSdss Storage Administration*.

You can use the following sub-options for the FCTOPPRCP option.

PRESMIRREQ

Specifies that the DFSMSdss FCTOPPRCPrimary option with the PRESMIRREQ subkeyword is to be used for the DFSMSdss COPY command. You can abbreviate PRESMIRREQ as PMR.

PRESMIRPREF

Specifies that the DFSMSdss FCTOPPRCPrimary option with the PRESMIRPREF subkeyword is to be used for the DFSMSdss COPY command. You can abbreviate PRESMIRPREF as PMP.

PRESMIRREQ and PRESMIRPREF are mutually exclusive.

Default value

FASTIC=NO

Usage notes

- To use the Advanced Image Copy Services, you must specify both the first and the second operands.
- The Advanced Image Copy Services requires that all load libraries of IMS HP Image Copy and its site default module are APF-authorized.
- When you create Fast Recovery image copies with the Advanced Image Copy Services, the use of DBRC=Y and registered database or area are recommended because the image copy time stamp is not saved in the output data set. If you create a Fast Recovery image copy with DBRC=N or for non-registered database or area, you must provide the appropriate log and change accumulation data sets manually at the time of recovery.
- When FASTIC=(,FDUMP) is specified and while image copies are being created, other applications can access the database data set only if DISP=SHR is specified. Otherwise, the IMS HP Image Copy job fails.

For more information about using the FASTIC keyword, see “Advanced Image Copy Services” on page 288.

FUNC keyword

The FUNC keyword specifies the function to be performed by IMS HP Image Copy for all data set groups or areas that are defined by the CAGRP keyword or the DBDSGRP keyword.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GROUP statement
If you specify a GROUP statement, you must always specify the FUNC keyword with a parameter.

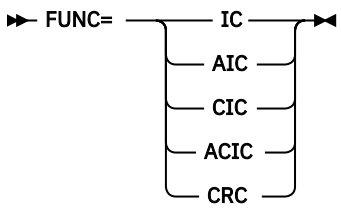
Site default option

Not supported

Related keywords

- “CAGRP keyword” on page 165
- “DBDSGRP keyword” on page 177

Format



IC

Specifies that the Image Copy function uses the batch image copy process.

AIC

Specifies that the Image Copy function uses the batch image copy process and runs the processes in parallel.

CIC

Specifies that the Image Copy function uses the concurrent image copy process.

ACIC

Specifies that the Image Copy function uses the concurrent image copy process and runs the processes in parallel.

CRC

Specifies that the Create Image Copy function creates copies of image copies.

Default value

None.

GDGBASE keyword

The GDGBASE keyword specifies whether IMS HP Image Copy creates a catalog entry for the generation data group.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

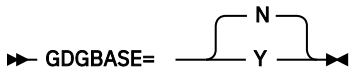
Site default option

Supported

Related keyword

None.

Format



Y

If the catalog entry does not exist, creates a catalog entry for the generation data group.

N

Does not create a catalog entry for the generation data group.

Default value

GDGBASE=N

GDGLIMIT keyword

The GDGLIMIT keyword specifies the maximum number of generation data sets that can be associated with the GDG that is being defined.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

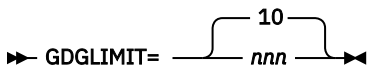
Site default option

Supported

Related keyword

"GDGBASE keyword" on page 193

Format



nnn

The left-aligned maximum number of generation data sets that can be associated with the GDG being defined. The number must be in the range of 1 - 255.

Default value

GDGLIMIT=10

GROUPDIGITS keyword

The GROUPDIGITS keyword specifies whether to enable or disable digit grouping for the numeric values printed in Database Statistics reports and Partition Statistics reports of HD Pointer Checker, which are generated by HASH Check.

This option is effective when HDPC=Y or HDPC=O is specified.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

Site default option

Supported

Related keyword

"HDPC keyword" on page 196

Format

Y or YES

Enables digit grouping and uses comma (,) as the digit grouping symbol. For example, a value of 1,000,000 is printed as 1,000,000. GROUPDIGITS=YES is the default value.

(NO,DBSTAT)

Disables digit grouping. For example, a value of 1,000,000 is printed as 1000000. This option allows to print numeric values that are greater than the maximum value a report field can display when digit grouping is enabled.

Default value

GROUPDIGITS=YES

GRPLIM keyword

The GRPLIM keyword specifies the maximum number of tasks to be processed in parallel within a group.

If the number of data sets that are registered in the group (CAGRP or DBDSGRP) of DBRC is greater than the value specified for the GRPLIM keyword, IMS HP Image Copy processes the number of subtasks that are specified on the GRPLIM keyword in parallel, and the subtasks that exceed this number are held in a wait state until one of the data set processes ends.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement

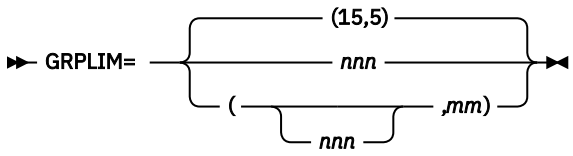
Site default option

Supported

Related keywords

- "CAGRP keyword" on page 165
- "DBDSGRP keyword" on page 177

Format



nnn

The left-aligned maximum number of tasks in the GROUP. Valid value is 0 - 253. When the specified value is 0, it means GRPLIM=253. The default value is 15.

mm

The left-aligned maximum number of tasks in the GROUP for the Offload Copy process. Valid value is 0 - 64. When the specified value is 0, it means GRPLIM=(,64). The default value is 5.

Default value

GRPLIM=(15,5)

Usage notes

- If the number of data sets that are registered to CAGRP or DBDSGRP of DBRC is fewer than the value on the GRPLIM keyword, or the GRPLIM keyword is not specified with FUNC=AIC or FUNC=ACIC, IMS HP Image Copy processes all data sets in parallel.
- This keyword is ignored if it is specified with STACK=*ddname*, FUNC=IC, or FUNC=CIC.

GSGNAME keyword

The GSGNAME keyword specifies the global service group (GSG) name for Remote Site Recovery (RSR).

Functions that support this keyword

- Image Copy function
- Recovery function

Statements that support this keyword

GLOBAL statement

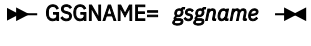
Site default option

Not supported

Related keyword

None.

Format



gsgname

The name of the global service group name.

Default value

None.

HDPC keyword

The HDPC keyword enables the pointer check function (HASH Check) of HD Pointer Checker.

This keyword is effective when the executing function is batch image copy or concurrent image copy.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

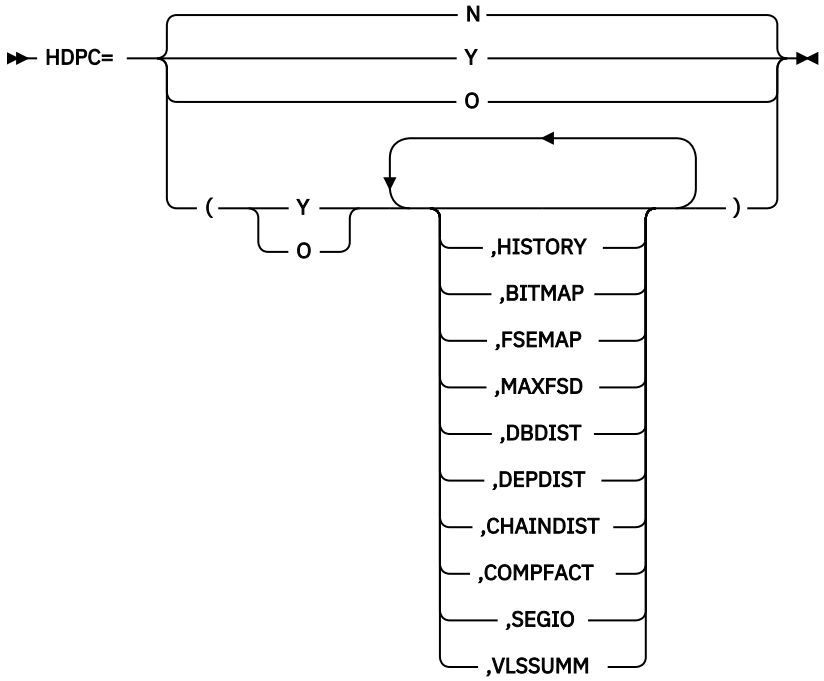
Site default option

Supported

Related keyword

None.

Format



Y

Enables the HD Pointer Checker HASH Check option during the execution of the Image Copy function. If HDPC=Y is specified for a database that is not supported by the HD Pointer Checker HASH Check option, an image copy of the database is created but no pointer checking is done.

O

Enables the HD Pointer Checker HASH Check option, but output image copy is not created, and therefore not notified as UIC for primary and secondary index data set.
If HDPC=O is specified for data sets other than the primary or the secondary index data set, the Image Copy function runs the same process as if HDPC=Y is specified.

N

Does not enable the HD Pointer Checker HASH Check option.

HISTORY

Requests to update the HISTORY data set of the database data sets to analyze. If the HISTORY option is specified, the HISTORY data set is required.
This option can be specified when HDPC=Y is specified and the DBDEFCTL data set is not specified or dummy; that is, when the HASH Check option runs in single step. This option cannot be specified for multiple-step HASH Check runs. If you want to specify the HISTORY option for multiple-step HASH Check runs, specify HISTORY=YES on the PROCCTL statement.

For details about the HISTORY option, see the *IMS High Performance Pointer Checker User's Guide*.

BITMAP

Generates a Bit Map Display report for the HDAM, HIDAM, PHDAM, or PHIDAM database.
This option is effective for the single-step HD Pointer Checker HASH Check option. For multiple-step HASH Check runs, specify REPORT BITMAP in the PROCCTL data set for the DBD Analysis program.

FSEMAP

Generates a Free Space Map report for the HDAM, HIDAM, PHDAM, or PHIDAM database.
This option is effective for the single-step HD Pointer Checker HASH Check option. For multiple-step HASH Check runs, specify REPORT FSEMAP in the PROCCTL data set for the DBD Analysis program.

MAXFSD

Generates a Maximum Free Space Distribution report for the HDAM, HIDAM, PHDAM, or PHIDAM database.
This option is effective for the single-step HD Pointer Checker HASH Check option. For multiple-step HASH Check runs, specify REPORT MAXFSD in the PROCCTL data set for the DBD Analysis program.

DBDIST

Generates the DB Record Distribution Statistics report. It is available for HDAM, HIDAM, PHDAM, and PHIDAM databases. This report contains the following information:

```
TOTAL NUMBER OF SEGMENTS (ROOTS + DEPENDENTS) IN THE DATA SET MAXIMUM ROOTS PER BLOCK
```

DBDIST is not supported under the following conditions:

- Multiple-step HASH Check
- Concurrent image copy process
- The HASH Check option is called from an IMS Database Reorganization Expert job

DEPDIST

Prints the following three parts about dependent segments, in the DB Record Distribution Statistics report:

- Distribution summary of dependent segments
- Distribution of dependent segments in root block
- Distribution of dependent segments by segment code

The DBDIST option controls whether to print the DB Record Distribution Statistics report. If you specify DEPDIST, you must also specify DBDIST. If DEPDIST is specified, but DBDIST is not specified, it is assumed that both DEPDIST and DBDIST are specified, thus the above three parts and DB Record Distribution Statistics report are printed.

CHAINDIST

Prints the Distribution of RAP Chain Lengths part in the DB Record Distribution Statistics report. This part is printed for HDAM or PHDAM databases.
Randomizer module is used for this option. Specify the data set name that contains the randomizer module on the STEPLIB DD statement.

If a segment edit/compression exit routine is defined to the root segment, the segment edit/compression exit module is used for this option. Specify the data set name that contains the segment edit/compression exit on the STEPLIB DD statement.

It is supported for the single-step HASH Check option that is called from an IMS HP Image Copy job.

CHAINDIST is not supported under the following conditions:

- Multiple-step HASH Check
- Concurrent image copy process
- The HASH Check option is called from an IMS Database Reorganization Expert job

COMPFACT

Prints the compression factor in the Partition Statistics report and the Database Statistics report. A segment edit/compression routine is used for this option.
Specify the data set name that contains the exit load module to the STEPLIB DD statement. It is supported in the single-step HASH Check under IMS HP Image Copy job.

COMPFACT is not supported under the following conditions:

- Multiple-step HASH Check
- Concurrent image copy process
- The HASH Check option is called from an IMS Database Reorganization Expert job

SEGIO

Prints the Rate of Segment I/O occurrence part in the Partition Statistics report and the Database Statistics report. It is available for HDAM, HIDAM, PHDAM, and PHIDAM databases.
If SEGIO is specified for databases other than the above, it is ignored.

SEGIO is supported for the single-step HASH Check option that is called in an IMS HP Image Copy job. It is not supported for multiple-step HASH Check runs.

VLSSUMM

Prints the summary of VL segment sizes in the Partition Statistics report and Database Statistics report. VLSSUMM is supported for the single-step HASH Check option that is called in an IMS HP Image Copy job. It is not supported for multiple-step HASH Check runs.

If VLSSUMM is specified for multiple database data sets, this option is effective for all of those database data sets.

Default value

HDPC=N

Usage note

DBDIST, CHAINDIST, COMPFACT, and DEPDIST parameters of the HDPC keyword cannot be specified with CIC, ACIC, GROUP FUNC=CIC, or GROUP FUNC=ACIC statement. If these parameters are specified in the GLOBAL statement, they are ignored in subsequent CIC, ACIC, GROUP FUNC=CIC, and GROUP FUNC=ACIC statements.

HOMECHK keyword

The HOMECHK keyword specifies to print the DISTRIBUTION OF ROOT SEGMENTS part in the DB Record Distribution Statistics report of HD Pointer Checker.

It is printed for HDAM or PHDAM databases, and only for the data set group that contains root segments. This keyword is supported for the single-step HASH Check option.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

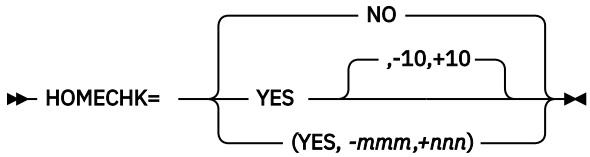
Site default option

Supported

Related keyword

"HDPC keyword" on page 196

Format



YES (or Y)

(YES,-*mmm*,+*nnn*)

Prints the DISTRIBUTION OF ROOT SEGMENTS part. Y can be used as a shortened form for YES. *mmm* is the backward distance from the home block (1-999) and *nnn* is the forward distance from the home block (1-999). Plus sign (+) can be omitted.

If only YES is specified, the range is assumed as -10 to +10. The randomizer module is used for this option. Specify the data set name that contains the randomizer module on the STEPLIB DD statement.

If a segment edit/compression exit routine is defined for a root segment, the segment edit/compression exit module is used for this option. Specify the name of the data set that contains the segment edit/compression exit on the STEPLIB DD statement.

NO (or N)

Does not print the DISTRIBUTION OF ROOT SEGMENTS part. N can be used as a shortened form for NO.

Default value

HOMECHK=NO

HPIO keyword

The HPIO keyword specifies whether to use the HP Input/Output interface.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- RCV statement
- CRC statement

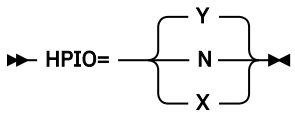
Site default option

Supported

Related keyword

None.

Format



Y

Enables HP Input/Output.
HP Input/Output uses EXCP for input and output OSAM data sets and for input VSAM ESDS data sets. This keyword is ignored for other types of data sets and for concurrent image copy generation for VSAM ESDS of full-function databases. The basic access methods are used in these cases.

N or X

Uses the standard management methods to read and write image copy data sets. Standard data management is processed through HP Input/Output for input and output OSAM data sets and for generating clean image copies for VSAM ESDS data sets.
This keyword is ignored for other types of data sets and for concurrent image copy generation for VSAM ESDS. The basic access methods are used in these cases.

Default value

HPIO=Y

Usage note

To apply HPIO=Y, all load libraries of IMS HP Image Copy and its site default module must be APF-authorized.

ICBUF keyword

The ICBUF keyword specifies the number of buffers to be used to access the output image copy data sets.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Site default option

Supported

Related keyword

None.

Format

nnn

The left-aligned number of buffers used to access the output image copy data sets. Specify the value in the range of 0 - 255.

Default value

The default value is 50.

ICCAT keyword

The ICCAT keyword specifies whether IMS HP Image Copy catalogs output image copy data sets.

Functions that support this keyword

- Image Copy function

- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

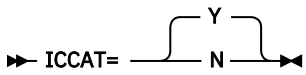
Site default option

Supported

Related keyword

None.

Format



Y

Catalogs the output image copy data sets.

N

Does not catalog the output image copy data sets.

Default value

ICCAT=Y

Usage note

Even if ICCAT=N is specified, when FASTIC=COPY is specified, ICCAT=N is ignored and the output image copy data sets are cataloged.

ICDALLOC keyword

The ICDALLOC keyword specifies whether IMS HP Image Copy dynamically allocates output image copy data set if relevant DD statements are not supplied in the JCL.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

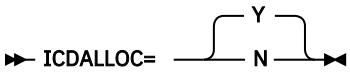
Site default option

Supported

Related keyword

None.

Format



Y

Dynamically allocates the output image copy data sets if the relevant DD statements are not supplied in the JCL.

N

Uses the JCL specification to allocate the output image copy data sets.

Default value

ICDALLOC=Y

> **Attention:** If output image copy data sets are dynamically allocated as generation data group (GDG) data sets, the oldest generation data set is deleted when the maximum number of generation data sets is reached. This is true even when the Image Copy function or the Create Image Copy function fails to create image copies successfully. For more information, see "Attention: Oldest GDG data set might be deleted" on page 276.

ICDUMP keyword

The ICDUMP keyword specifies the DD name of the input image copy data set.

Functions that support this keyword

- Recovery function
- Create Image Copy function

Statements that support this keyword

- RCV statement
- CRC statement

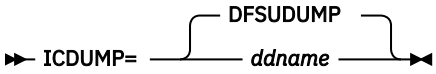
Site default option

Not supported

Related keyword

None.

Format



ddname

Specify the DD name of the input image copy data set.

Default value

ICDUMP=DFSUDUMP

ICHLQ keyword

The ICHLQ keyword specifies the data set name prefix for the image copy data set.

You can use data set name prefix when you request dynamic allocation of the output image copy data set by specifying ICDALLOC=Y, ICOUT=*, or the STACK keyword.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

If you specify the DSN keyword for the naming template, or if you do not specify the DSN keyword and the output data set is specified by the ICOUT keyword, you can use the ICHLQ keyword for the following statements:

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

The value specified on the GLOBAL statement can be overwritten by each GROUP, IC, AIC, CIC, ACIC, and CRC statement.

If you do not specify the DSN keyword and the output data set is specified by the STACK keyword, you can use the ICHLQ keyword for the following statement:

- GLOBAL

The ICHLQ values specified for other ICEIN statements are ignored.

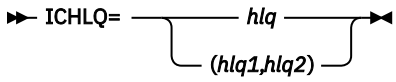
Site default option

Supported

Related keyword

None.

Format



hlq

The data set name prefix of the output image copy data set for the Image Copy function or the Create Image Copy function, or sets a value in &ICHLQ.

hlq1

The data set name prefix of the primary output image copy data set for the Image Copy function, or sets a value in &ICHLQ.

hlq2

The data set name prefix of the secondary output image copy data set for the Image Copy function, or sets to a value in &ICHLQ2.

Default value

None.

Usage notes

- The *hlq2* parameter and the ICHLQ2 keyword cannot be specified together.
- The prefix is used as the high-level qualifier of the data set name.
- This prefix must conform to the normal data set naming standards; it can include periods but must not end with a period.
- MVS™ naming convention requires that the generated data set name contains 44 or fewer characters.
- If you do not specify the DSN keyword, and if you specify the output data set by using the ICOUT keyword and use the default naming rule with ICNMRULE=N, *hlq* can be specified as the data set name prefix containing 33 or fewer characters.
- If you do not specify the DSN keyword, and if you specify the output data set by using the STACK keyword or use the default naming rule with ICNMRULE=Y, *hlq* can be specified as the data set name prefix containing 7 or fewer characters.
- If you specify the DSN keyword, *hlq* can be specified as the data set name prefix containing 44 or fewer characters.

- If this keyword is left blank, data set name prefix is not assigned.

ICHLQ2 keyword

The ICHLQ2 keyword specifies the data set name prefix for the secondary image copy data set.

If the DSN2 keyword is specified, IMS HP Image Copy refers to the symbolic parameter $ICHLQ2 to assign the data set name prefix. If the DSN2 keyword is not specified, IMS HP Image Copy uses the high-level qualifier (*hlq2*) that the ICHLQ2 keyword specifies for the prefix of the secondary image copy data set.

You can use data set name prefix when you request dynamic allocation of the output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

If you specify the DSN keyword for a naming template, or if you do not specify the DSN keyword and the output data set is specified by the ICOUT keyword, you can use the ICHLQ2 keyword for the following statements:

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

The value specified on the GLOBAL statement can be overwritten by each GROUP, IC, AIC, CIC, ACIC, and CRC statement.

If you do not specify the DSN keyword and the output data set is specified by the STACK keyword, you can use the keyword for the following statement:

- GLOBAL statement

The value specified on other ICEIN statements is ignored.

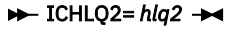
Site default option

Supported

Related keyword

None.

Format



hlq2

The data set name prefix of the secondary output image copy data set for the Image Copy function or the Create Image Copy function, or sets a symbolic value of &ICHLQ2.

Default value

None.

Usage notes

- The ICHLQ2 keyword cannot be specified with ICHLQ=(*hlq1,hlq2*).
- This prefix is used as the high-level qualifier of the data set name.
- This prefix must conform to the normal data set naming standards; it can include periods but must not end with a period.
- MVS™ naming convention requires that a generated data set name contain 44 or fewer characters.

- If you do not specify the DSN keyword, and if you specify the output data set by using the ICOUT keyword and use the default naming rule with ICNMRULE=N, *hlq* can be specified as the data set name prefix containing 33 or fewer characters.
- If you do not specify the DSN keyword, and if you specify the output data set by using the STACK keyword or use the default naming rule with ICNMRULE=Y, *hlq* can be specified as the data set name prefix containing 7 or fewer characters.
- If you specify the DSN keyword, *hlq* can be specified as the data set name prefix containing 44 or fewer characters.
- If this keyword is left blank, a data set name prefix is not assigned.

ICHLQ*n* keyword

The ICHLQ*n* keyword specifies the data set name prefix for the *n*th image copy data set.

If the DSN*n* keyword is specified, IMS HP Image Copy refers to the symbolic parameter $ICHLQ*n* to assign the data set name prefix. If the DSN*n* keyword is not specified, IMS HP Image Copy uses the high-level qualifier (*hlqn*) that the ICHLQ*n* keyword specifies for the prefix of the *n*th image copy data set.

You can use such a prefix when you dynamically allocate an output image copy data set by use of Create Image Copy.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

If you specify the DSN keyword for a naming template, or if you do not specify the DSN keyword and the output data set is specified by the ICOUT keyword, you can use the ICHLQ*n* keyword for the following statements:

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

The value specified on the GLOBAL statement can be overwritten by each GROUP, IC, AIC, CIC, ACIC, and CRC statement.

If you do not specify the DSN keyword and the output data set is specified by the STACK keyword, you can use the keyword for the following statement:

- GLOBAL statement

The value specified in the other ICEIN statements is ignored.

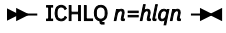
Site default option

Supported

Related keyword

None.

Format



n

Use ICHLQ*n* to specify the data set name prefix for the *n*th output image copy data set. *n* is 3 through 7. For example, use ICHLQ5 to specify the data set name prefix for the fifth output image copy data set.

hlqn

The data set name prefix of the *n*th output image copy data set for the Create Image Copy function, or sets a value in &ICHLQ*n*.

Default value

None.

Usage notes

- This prefix is used as the high-level qualifier of the data set name.
- This prefix must conform to the normal data set naming standards; it can include periods but must not end with a period.
- MVS™ naming convention requires that a generated data set name contain 44 or fewer characters.
- If you do not specify the DSN keyword, and if you specify the output data set by using the ICOUT keyword and use the default naming rule with ICNMRULE=N, *hlq* can be specified as the data set name prefix containing 33 or fewer characters.
- If you do not specify the DSN keyword, and if you specify the output data set by using the STACK keyword or use the default naming rule with ICNMRULE=Y, *hlq* can be specified as the data set name prefix containing 7 or fewer characters.
- If you specify the DSN keyword, *hlq* can be specified as the data set name prefix containing 44 or fewer characters.
- If this keyword is left blank, no data set name prefix is assigned.

ICNMRULE keyword

The ICNMRULE keyword selects the naming convention for the output image copy data set when used together with ICOUT=*|(*,*).

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

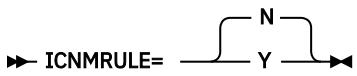
Site default option

Supported

Related keyword

"ICOUT keyword" on page 207

Format



Y

Uses the following naming convention for the output image copy data set:

```
ichlq.ICn.dbdname.ddname.Dyyddd.Thhmmss
```

N

Uses the following naming convention for the output image copy data set:

```
ichlq.ICn.dbdname.ddname.
```

where:

ichlq

The value specified by the ICHLQ keyword.

n

1 or 2, indicating the primary or secondary copy.

dbdname

The DBD name of the database to be copied.

ddname

The DD name of the target date set group or area to be copied.

yyddd

The date.

hhmmss

The time stamp.

Default value

ICNMRULE=N

Usage notes

- The selected naming convention is used if the output image copy data set is dynamically allocated with the ICOUT keyword.
- If the STACK keyword is specified in the control statement, the ICNMRULE keyword is ignored.

For more information about output image copy data sets, see "Output image copy data sets" on page 276.

ICOUT keyword

The ICOUT keyword specifies the DD name of the output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Either the ICOUT or the STACK keyword is required in these statements.

Site default option

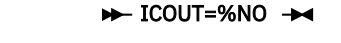
Supported

Related keyword

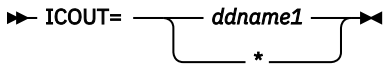
None.

Format

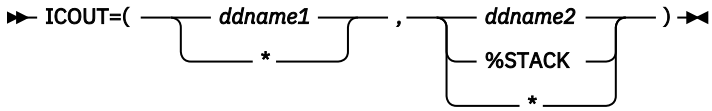
To create no image copy data sets:



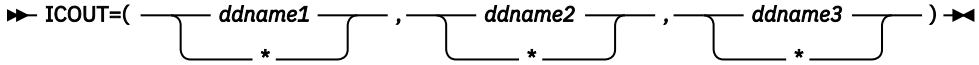
To create only the primary image copy data set:



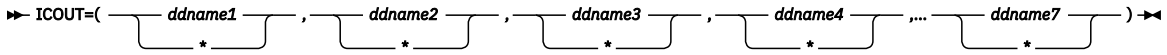
To create the primary and the secondary image copy data sets:



To create three image copy data sets:



To create four or more image copy data sets:



ddname1

The DD name of the primary output data set.

ddname2

The DD name of the secondary output data set.

%NO

Runs HASH Check but does not create output image copy data sets. You can specify this parameter only for the Image Copy function.

%STACK

The keyword parameter for the secondary image copy data set that is stacked when the process for the primary image copy is Advanced Image Copy Services and the output format is Fast Recovery image copy format.
%STACK is effective under the following conditions:

- FASTIC=(REQ|PREF,COPY): The format of the primary image copy data set is Fast Recovery image copy format.
- OFFLDTYPE=S and OFFLDSTACK=* or OFFLDSTACK=*ddname*: The secondary image copy data set is stacked.

ddname3

The DD name of the third output data set.

ddname4

The DD name of the fourth output data set.

ddname5

The DD name of the fifth output data set. You can specify this parameter only for the Create Image Copy function.

ddname6

The DD name of the sixth output data set. You can specify this parameter only for the Create Image Copy function.

ddname7

The DD name of the seventh output data set. You can specify this parameter only for the Create Image Copy function.

*****

Specifies that the DD name of the output image copy is determined internally. The output image copy data set is dynamically allocated.

(*,*,*,...,*)

Specifies that output image copy data sets (one for each asterisk) are allocated dynamically.

Examples:

- To create two image copy data sets with specific data set names, specify the keyword as follows:

  ```
  ICOUT=(ICOUT1,ICOUT2)
  ```

  where ICOUT1 DD and ICOUT2 DD define the actual data set names.
- To create four image copy data sets without specifying their names, specify the keyword as follows:

  ```
  ICOUT=(*,*,*,*)
  ```

- To create three image copy data sets and to specify the name only for the third image copy data set, specify the keyword as follows:

  ```
  ICOUT=(*,*,ICOUT3)
  ```

  where ICOUT3 DD defines the actual data set name.

Default value

None.

Usage notes

- The ICOUT and the STACK keywords are mutually exclusive.
- The value for ICOUT or STACK can be defined in the site default table.
- ICOUT=*ddn* and ICOUT=(*ddn1*,*ddn2*,..) cannot be specified in the GLOBAL statement and in the site default table.
- ICOUT=%NO cannot be specified in the site default table.
- ICOUT=* is the default value for the Image Copy function under IMS Database Reorganization Expert and IMS Database Recovery Facility.
- If ICOUT=%NO is specified for all databases when the HASH Check option is not requested, the image copy processing ends with a return code of 16, and error message FABJ0252E is issued.
- Checkpoint Restart cannot be enabled for the database or the area when ICOUT=%NO. Even when Checkpoint Restart is requested and a process error is found during the job, the database or the area is not reprocessed by Checkpoint Restart.
- If you request more than two image copies and if DBRC=Y is specified, only the primary and secondary image copy data sets are registered to the DBRC RECON data set.
- If an error is found in the primary or the secondary image copy data set while processing the Image Copy function, the third and the fourth image copies are not registered to the DBRC RECON data set.
- When one of the following conditions is met, the maximum number of image copy data sets that the Image Copy function can create for each database data set in a single run is two.
  - Fast Recovery image copy format of Advanced Image Copy Services is requested (FASTIC=(*opt*,COPY))
  - IMS HP Image Copy process is called from one of the following IMS Tools:
    - Parallel Reorganization Service of IMS Database Reorganization Expert
    - IMS HP Fast Path Utilities
    - IMS Database Recovery Facility
    - IMS Online Reorganization Facility

ICUNIT keyword

The ICUNIT keyword specifies the name of the unit on which the input image copy data set resides.

Functions that support this keyword

- Recovery function

- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- RCV statement
- CRC statement

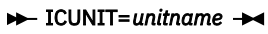
Site default option

Supported

Related keyword

"IGNORCAT keyword" on page 211

Format



unitname

The unit name of the input image copy data set for dynamic allocation.

Default value

None.

Usage note

The following table shows how the Recovery function and the Create Image Copy function handle the unit parameter for dynamic allocation.

Table 94: How Recovery function and Create Image Copy function handle the unit parameter

Specification of ICUNIT	DBRC status is CATDS and input IC is cataloged	DBRC status is CATDS and input IC is not cataloged	DBRC status is NOCATDS
ICUNIT=*unitname*	Ignore ICUNIT. Use catalog information.	Use ICUNIT.	Use ICUNIT.
Omit ICUNIT	Use catalog information.	Use the unit name in the IC record in DBRC.	Use the UNIT name in the IC record in DBRC.

IC_ERROR keyword

The IC_ERROR keyword specifies to terminate all image copy processes for all database data sets when an error occurs in one of the image copy processes.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

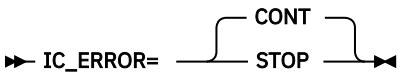
Site default option

Supported

Related keywords

- "RETCDDSN keyword" on page 228
- "SHDW_ERROR keyword" on page 239

Format



CONT

Image copy processing continues even if an error occurs.

STOP

Image copy processing for all database data sets terminates when an error occurs in one of the image copy processes.

Default value

IC_ERROR=CONT

Usage notes

- IC_ERROR=STOP does not take effect if the return code of the error is changed to 8 or less with the Return Code Handling option (HPSRETCD control statement).
- If both IC_ERROR=STOP and SHDW_ERROR=STOP are specified, SHDW_ERROR=STOP is ignored.

IDXSRCH keyword

The IDXSRCH keyword specifies to search for related index DBDS while it creates virtual image copies (VIC).

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

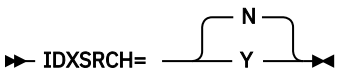
Site default option

Supported

Related keyword

"VIC keyword" on page 263

Format



Y

Searches for related primary and secondary index DBDSs from the DBD and creates VIC automatically.

N

Does not search the related primary or the secondary index DBDSs.

Default value

IDXSRCH=N

Usage note

To specify IDXSRCH=Y, you must also specify VIC=Y.

IGNORCAT keyword

The IGNORCAT keyword specifies whether IMS HP Image Copy uses the catalog information when it dynamically allocates input data sets.

Functions that support this keyword

- Recovery function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

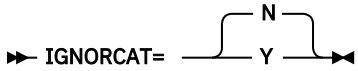
Site default option

Supported

Related keyword

- “CAUNIT keyword” on page 165
- “ICUNIT keyword” on page 209
- “LOGUNIT keyword” on page 215

Format



Y

Ignores DBRC CATDS status and dynamically allocates input data sets without catalog information. IMS HP Image Copy uses the UNIT name that is registered to RECON or that is specified by the ICEIN keyword CAUNIT, ICUNIT, or LOGUNIT.

N

Uses catalog information if DBRC is in CATDS status. If DBRC is in NOCATDS status, IMS HP Image Copy uses the UNIT name in the RECON record or that is specified by the ICEIN keyword.

Default value

IGNORCAT=N

ITKBLOAD keyword

The ITKBLOAD keyword specifies the IMS Tools KB load module data set.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

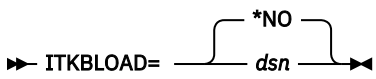
Site default option

Supported

Related keyword

“ITKBSRVR keyword” on page 213

Format



dsn

The name of the IMS Tools KB load module data set.

***NO**

Loads the IMS Tools KB modules from the private library or the system library of the job.

Default value

ITKBLOAD=*NO

ITKBSRVR keyword

The ITKBSRVR keyword specifies the name of the IMS Tools KB server XCF group.

This keyword is required if you want to store IMS HP Image Copy reports or sensor data in the repositories of IMS Tools Knowledge Base.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

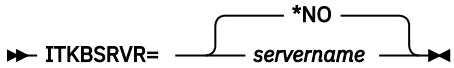
Site default option

Supported

Related keywords

- “ITKBLOAD keyword” on page 212
- “SENSOR keyword” on page 232
- “TOIXCFGR keyword” on page 259

Format



servername

Stores reports in the IMS Tools KB Output repository of the specified server.

***NO**

Does not store reports in the IMS Took KB Output repository.

Default value

ITKBSRVR=*NO

Usage notes

- To store the IMS HP Image Copy reports and IMS HP Pointer Checker reports in the IMS Tools KB repository in IMS Online Reorganization Facility jobs, specify the IMS Tools KB server name by using one of the following keywords:
  - For HALDBs, specify the server XCF group name on the ITKBSERVER keyword in HRFSYSIN DD. The ITKBSRVR keyword in ICEIN DD or in the IMS HP Image Copy site default table is not effective for HALDBs. If you do not specify the ITKBSERVER keyword, and if the ITKBSRVR keyword is specified in ICEIN DD or in the IMS HP Image Copy site default table, a warning message (FABJ0221W) is issued.
  - For non-HALDBs, specify the server XCF group name either on the ITKBSRVR keyword in ICEIN DD or on the ITKBSERVER keyword in HRFSYSIN DD. The ITKBSRVR keyword in the IMS HP Image Copy site default table is also effective.
- When you use the DB Sensor function to collect sensor data from a full-function database, certain considerations apply to the collected data element values. For details, see the topic "Considerations for collecting sensor data from full-function databases" in the *IMS Solution Packs Data Sensor User's Guide*.

IXKEYCHK keyword

The IXKEYCHK keyword invokes the Index key HASH Check of the HD Pointer Checker utility.

This keyword is effective when HDPC=Y is specified and it is supported for the single-step HASH Check option.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

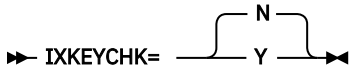
Site default option

Supported

Related keyword

"HDPC keyword" on page 196

Format



Y

Requests the index key HASH Check .

N

Does not request the index key HASH Check.

Default value

IXKEYCHK=N

KEYLABEL keyword

The KEYLABEL keyword specifies the key label used for data set encryption.

KEYLABEL='*key_label*' specifies that the base cluster is to be encrypted. Any alternate index associated with the base cluster will also be encrypted and use the same key label as specified for the cluster.

For more information about data set encryption support, see "Data set encryption support" on page 36.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

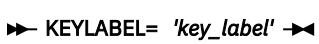
Site default option

Supported

Related keyword

None.

Format



key_label

Specifies the name, up to 64 bytes, of the key label to be used to encrypt image copy data sets. The parameter must be enclosed in single quotation marks (').
If a key label is defined as a DATACLAS attribute used for the allocation of the data sets, the key label you specify for the KEYLABEL keyword overrides the key label defined for DATACLAS.

See the topic "Understanding the Order of Assigned Data Set Attributes" in *z/OS® DFSMS Access Method Services Commands* to learn more about the order of precedence (filtering) the system uses to select the key label.

Default value

None.

Usage note

The KEYLABEL keyword cannot be used with the COPY process of Advanced Image Copy Services. The original key labels that are used for the input database data sets are inherited.

LBI keyword

The LBI keyword specifies whether to use the large block interface (LBI), which allows block sizes that are greater than 32 KB, when IMS HP Image Copy dynamically allocates output image copy data sets on a tape device.

If the output device is not a tape, this keyword is ignored.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

Site default option

Supported

Related keyword

None.

Format

Y

Uses the LBI when creating output image copy data sets.

N

Does not use the LBI when creating output image copy data sets.

Default value

LBI=N

Usage notes

- LBI=Y is applied only when the output device is a tape, including virtual tape. If the output device is DASD, LBI=Y is ignored.
- When the LBI is applied, the block size of the output data sets is larger than 32,760 bytes.

LOGUNIT keyword

The LOGUNIT keyword specifies the name of the unit on which the input log data set resides.

Functions that support this keyword

Recovery function

Statements that support this keyword

- GLOBAL statement
- RCV statement

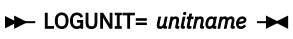
Site default option

Supported

Related keyword

"IGNORCAT keyword" on page 211

Format



unitname

The unit name of the log data set for dynamic allocation.

Default value

None.

Usage note

The following table shows how the Recovery function handles the unit parameter for dynamic allocation.

Table 95: How Recovery function handles the unit parameter

Specification of LOGUNIT	DBRC status is CATDS and input log is cataloged	DBRC status is CATDS and input log is cataloged	DBRC status is NOCATDS
LOGUNIT=*unitname*	Ignore LOGUNIT. Use catalog information.	Use LOGUNIT.	Use LOGUNIT.
Omit LOGUNIT	Use catalog information.	Use the unit name in the LOG record in DBRC.	Use the unit name in the LOG record in DBRC.

LOGUSE keyword

The LOGUSE keyword specifies to use the update log that is registered to DBRC for recovery.

Functions that support this keyword

Recovery function

Statements that support this keyword

- GLOBAL statement
- RCV statement

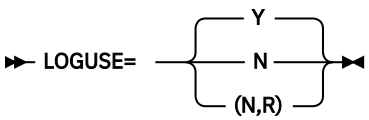
Site default option

Supported

Related keyword

None.

Format



Y

Uses the update log if the database was updated after the image copy was created.

N

Does not use the update log even if the database was updated after the image copy was created. If LOGUSE=N and DBRC=Y, recovery runtime is not registered to RECON.

(N,R)

Does not use the update log even if the database was updated after the image copy was created. If LOGUSE=(N,R) and DBRC=Y, recovery runtime is registered to RECON.

Default value

LOGUSE=Y

Usage note

LOGUSE=N and LOGUSE=(N,R) are ignored if the input image copy data set is a concurrent image copy (CIC).

MGMTCLAS keyword

The MGMTCLAS keyword specifies the name of the management class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Site default option

Supported

Related keyword

None.

Format

management_class_name

The name of the management class for allocating the data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

An ACS routine can override the management class that you specify for the MGMTCLAS keyword.

MGMTCLAS2 keyword

The MGMTCLAS2 keyword specifies the name of the management class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.

This keyword is effective only for secondary IC.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement

- CIC/ACIC statement
- CRC statement

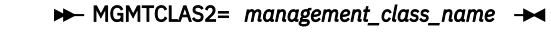
Site default option

Supported

Related keyword

None.

Format



management_class_name

The name of the management class for allocating the data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

An ACS routine can override the management class that you specify for the MGMTCLAS2 keyword.

MGMTCLAS*n* keyword

The MGMTCLAS*n* keyword specifies the name of the management class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

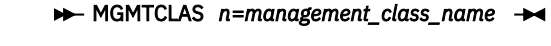
Site default option

Supported

Related keyword

None.

Format



n

Use MGMTCLAS*n* to specify the management class for the *n*th image copy data set. *n* is 3 through 7. For example, use MGMTCLAS5 to specify the management class for the fifth image copy data set.

management_class_name

The name of the management class for allocating the data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

An ACS routine can override the management class that you specify for the MGMTCLAS*n* keyword.

MSGFREQ keyword

The MSGFREQ keyword specifies how often IMS HP Image Copy issues progress messages during image copy operation.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

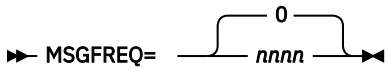
Site default option

Supported

Related keyword

None.

Format



nnnn

The record count interval at which the progress message is issued. Valid values are 0 - 32767. For example, MSGFREQ=2000 indicates that progress message FABJ9013I is issued for every 2000 records written to the output data set.

Default value

MSGFREQ=0 (progress messages are turned off.)

NOREUSE keyword

The NOREUSE keyword specifies that the image copy data sets that are cataloged in the system are not reused by the Image Copy function.

This keyword is effective for the Image Copy function only when the DBDS record of the database data set or the area data set is registered as NOREUSE in the DBRC RECON data set.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

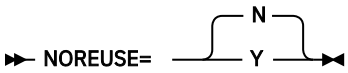
Site default option

Supported

Related keywords

- “DBRC keyword” on page 178
- “ICDALLOC keyword” on page 201

Format



Y

Does not reuse the image copy data sets cataloged in the system.

N

Reuses the image copy data sets if data sets with target names exist. Reuse occurs even when the DBDS record of the database data sets or the area data sets is registered as NOREUSE in DBRC RECON data sets.

Default value

NOREUSE=N

Usage notes

- This keyword is ignored if the process runs with DBRC=N.
- This option is effective even when the output image copy data set is to be dynamically allocated on a tape volume.
- NOREUSE=Y is effective when all of the following conditions are met:
  - The function is run with DBRC=Y.
  - The DBDS record of the database data set or area data set is registered as NOREUSE in the DBRC RECON data set.
  - The image copy data set is allocated dynamically by IMS HP Image Copy.
  - The name of the image copy data set that is expected to be allocated dynamically by IMS HP Image Copy is already cataloged in the system.
- If NOREUSE=Y is in effect and if an image copy data set that has the name as the target output image copy data set exists, the Image Copy function ends with a return code of 8. The names of the unprocessed database data sets or the area data sets are printed in messages FABJ0166E and FABJ0167E.

NOTIFY keyword

The NOTIFY keyword specifies to register output data sets to RECON.

This keyword can be specified regardless of whether the output data set of the Create Image Copy function is already registered to RECON.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- CRC statement

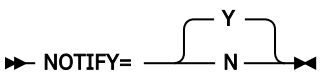
Site default option

Supported

Related keyword

"DBRC keyword" on page 178

Format



Y

If DBRC=Y is specified, the output data set is registered to the RECON data sets as either the primary or the secondary image copy data set.

N

Specifies that the output data set is not registered to the RECON data sets.

Default value

NOTIFY=Y

Usage note

Certain considerations apply to the use of the NOTIFY keyword with the Create Image Copy function. See "DBRC IC record registration" on page 129.

NOTIFYMODE keyword

The NOTIFYMODE keyword specifies the condition for registering image copy record to RECON.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

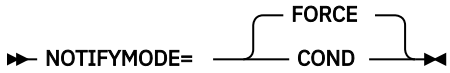
Site default option

Supported

Related keyword

- "DBRC keyword" on page 178
- "DEDBPC keyword" on page 179
- "HDPC keyword" on page 196
- "RESTART keyword" on page 227

Format



FORCE

Registers the image copy record to DBRC RECON regardless of how the image copy processing ended.

COND

Conditionally registers the image copy record to DBRC RECON based on the result of image copy processing.
If image copy processing ends in one of the following conditions, the Image Copy function does not register the image copy record to DBRC RECON:

- Errors in the image copy processing, such as I/O errors or invalid input data format
- Errors in HASH pointer check processing (enabled by HDPC=Y or DEDBPC=Y)
- If a DL/I database, HALDB partition, or DEDB area is to be reprocessed in the next run by the Checkpoint Restart function (enabled by RESTART=Y). For considerations on IC registration of DEDB areas, see "Timing of image copy registration" on page 222.

If more than two image copy data sets are created for a database data set or area data set, and if the third or the fourth image copy data set is in error, the Image Copy function continues the process and registers the primary and secondary image copy data sets to the DBRC RECON data set.

If NOTIFYMODE=COND is specified, image copy registration is done by the units of databases instead of units of database data sets. For example, if a database consists of multiple database data sets, all image copies are registered to RECON after all the database data sets are successfully processed. This means, if an error is encountered when processing a database data set, no image copies are registered to RECON.

Default value

NOTIFYMODE=FORCE

Combination of NOTIFYMODE=COND and RESTART=*value*

If NOTIFYMODE=COND, RESTART=*value*, and HDPC=Y or DEDBPC=Y are specified, the behavior of IMS HP Image Copy varies based on the value that is specified in the RESTART keyword and the result of HASH pointer check.

The following table shows the behavior of IMS HP Image Copy for each condition.

Table 96: Behavior of IMS HP Image Copy for NOTIFYMODE=COND, RESTART, and HDPC=Y or DEDBPC=Y combination

Condition		**Actions taken**	
RESTART specification	**HASH error**	**Image copy registered to RECON?**	**Reprocessed in the next run by the Checkpoint restart function?**
(Y,HASH)	No error	Yes	No
(Y,HASH)	Unidentified error	No	Yes
(Y,HASH)	Severe error	No	No
Y	No error	Yes	No
Y	Unidentified error	Yes	No
Y	Severe error	No	No
N	No error	Yes	No
N	Unidentified error	Yes	No
N	Severe error	No	No

Note: For the meanings of HASH errors, see "Types of errors detected by HASH Check option" on page 42.

Timing of image copy registration

The timing that an image copy is registered to RECON varies based on the database type and the value that is specified in the NOTIFYCOND keyword.

If NOTIFYMODE=FORCE is specified, the timing that an image copy is registered does not vary by database type. All image copies are registered after image copies are created for each DBDS. For example, if you use the IC statement, all DBDSs are processed serially and each image copy is registered soon after the image copy is created.

If NOTIFYMODE=COND is specified, the timing that an image copy is registered varies by database type.

- For a DEDB, the timing of image copy registration is the same as the timing for NOTIFYMODE=FORCE if no error is detected in the image copy creation processing.
- For DL/I database and HALDB, all image copies are registered at the end of image copy job step. This is because DL/I database and HALDB might have logical relationships between databases, and that registering image copies at the end of job step avoids unnecessary image copies to be registered.

If a database group, such as CA group or DBDS group in DBRC, consists of both DEDB and DL/I database or DEDB and HALDB, the registration timing differs within that database group.

If you specify to take image copies for a database group that includes DEDB, and if you enable the Checkpoint Restart function for all the members of the group with the RSTTYPE=1 option, the registration of IC records are processed as follows:

- For DEDB areas, the IC records of successfully processed DBDSs will be registered to RECON and IC records of DBDSs that have errors will not be registered to RECON.

- For DL/I databases and HALDBs, no IC records are registered to RECON when an error is encountered while processing the members of the group.

However, in the restart processing, all the members will be reprocessed. This means that the registered IC records in the first run remain in the RECON as unnecessary records even when NOTIFYMODE=COND is specified.

The following table shows the difference in the timing of image copy registration to DBRC by NOTIFYCOND keyword and by database type.

Table 97: Difference in the timing of image copy registration

NOTIFYMODE value	Database type	Timing of the image copy registration to RECON
NOTIFYMODE=FORCE	DL/I, HALDB	At the end of the image copy process for the DBDS
NOTIFYMODE=FORCE	DEDB	At the end of the image copy process for the DBDS
NOTIFYMODE=COND	DL/I, HALDB (see note)	At the end of the image copy job step (if no error is detected)
NOTIFYMODE=COND	DEDB	At the end of the image copy process for the DBDS (if no error is detected)

Note: When processing a data set group, that is, when database consists of multiple database data sets, image copy is registered after the last database data set is processed.

OFFLDSTACK keyword

The OFFLDSTACK keyword specifies the ddname of the output stack that is created as the secondary image copy data set when the primary image copy is created in Fast Recovery image copy format by FASTIC=(,COPY) processing of Advanced Image Copy Services.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

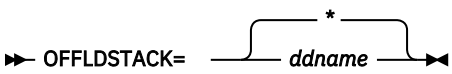
Site default option

Supported

Related keyword

“FASTIC keyword” on page 190

Format



ddname

The DD name of the secondary output image copy.

*****

The DD name of the secondary output image copy is determined internally.

Default value

OFFLDSTACK=*

Usage note

The OFFLDSTACK keyword is effective under the following conditions:

- FASTIC=(,COPY): The primary image copy data set is created in Fast Recovery image copy format.
- ICOUT=(*ddname1*,%STACK) or ICOUT=(*,%STACK)
- OFFLDTYPE=S: The secondary image copy data set is created as a standard format image copy of IMS HP Image Copy.

OFFLDTYPE keyword

The OFFLDTYPE keyword specifies the type of the secondary image copy data set when the primary image copy is created in Fast Recovery image copy format by FASTIC=(,COPY) processing of Advanced Image Copy Services.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

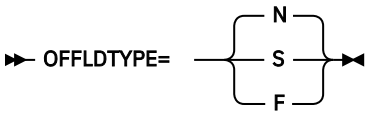
Site default option

Supported

Related keyword

“FASTIC keyword” on page 190

Format



N

Does not create the secondary image copy data set.

S

Creates the secondary image copy data set in standard image copy format of IMS HP Image Copy.

F

Creates the secondary image copy data set in Fast Recovery image copy format.

Default value

OFFLDTYPE=N

Usage note

The OFFLDTYPE=S or OFFLDTYP=F is effective under the following conditions:

- FASTIC=(,COPY): The primary image copy data set is created in Fast Recovery image copy format.
- The ICOUT keyword specifies to create the secondary image copy data set.

PART keyword

The PART keyword specifies the name of the partition to process.

This keyword is applicable to HALDBs only.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

- IC/AIC statement
- CIC/ACIC statement
- RCV statement
- CRC statement

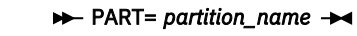
Site default option

Not supported

Related keyword

"DBD keyword" on page 175

Format



partition_name

The partition name that is registered to DBRC for each partition data set.
For the Image Copy function, *partition_name* can be specified with wildcard characters. Wildcard characters supported are asterisk (*) and percent (%) symbol. An asterisk (*) represents 0 - 7 characters, whereas a percent (%) symbol represents a single character. For example, `PART=part*` matches partA, part1A, part12A, and so on. If two or more asterisks (*) are specified in sequence, only the first asterisk is recognized.

When you use wildcard characters for the PART keyword, the following considerations apply:

- Wildcard characters cannot be used for the PART keyword when the PART keyword is used in a CRC or RCV control statement.
- DBRC=Y must be specified.
- The DDN keyword must not be specified.

Default value

None.

RECALL keyword

The RECALL keyword recalls input database data sets if the data sets are migrated by DFSMShsm.

To apply the RECALL option, DFSMShsm must be started in the system and the input database data sets must be SMS-managed data sets.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

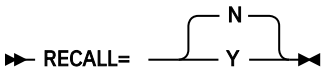
Site default option

Supported

Related keywords

None.

Format



Y

Recalls the migrated input database data sets.

N

Does not recall the input database data sets even if the data sets are migrated.

Default value

RECALL=N

Usage note

Do not use the RECALL option for non-SMS-managed data sets. If the RECALL option is applied to non-SMS-managed data sets, the Image Copy function issues the DFSMShsm macro to recall the data sets but the result is unpredictable.

REGTIMESTMP keyword

The REGTIMESTMP keyword specifies how IMS HP Image Copy adds time stamps to output image copy data sets. This keyword is effective when FASTIC=(,FDUMP) is specified.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

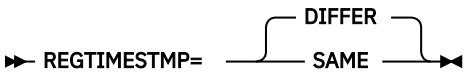
Site default option

Supported

Related keyword

"FASTIC keyword" on page 190

Format



SAME

Indicates that the time stamp values are the same for all created image copy data sets.

DIFFER

Indicates that the time stamp values differ by each created image copy data set.

Default value

REGTIMESTMP=DIFFER

Usage notes

- The REGTIMESTMP keyword is effective when FASTIC=(,FDUMP) is specified. When FASTIC=(,FDUMP) is not specified, this keyword is ignored.
- Advantage of REGTIMESTMP=SAME is that you can have the same recovery point for all target databases. Disadvantage of REGTIMESTMP=SAME is that elapsed time of the job is longer than when run with REGTIMESTMP=DIFFER. This is because (shadow) image copy creation processes start after obtaining all authorizations for the target databases, and because the databases are released after each (shadow) image copy process is complete. However, for FASTIC=(,FDUMP) process, the difference is not significant because the shadow image copies are created by FlashCopy®.
- If you specify this keyword with the Checkpoint Restart function, which is activated by the RESTART=Y keyword, only the restarted image copies will have the same time stamp values. If you want all the target databases to have the same time stamp values, you must not use the Checkpoint Restart function.

RESTART keyword

The RESTART keyword specifies whether to enable Checkpoint Restart for automatic restart of image copy processing.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

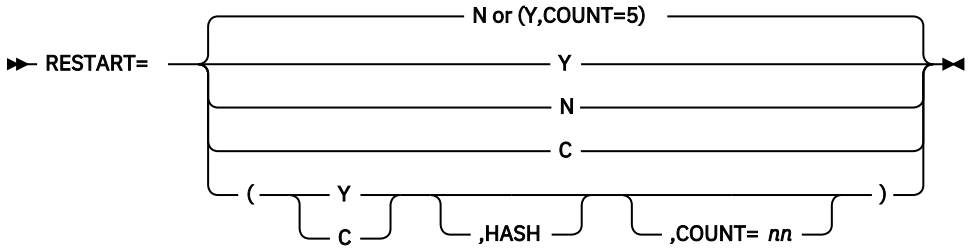
Site default option

Supported

Related keyword

None.

Format



Y

Enables both checkpoint and restart. To specify Y, you must supply the checkpoint file with the CHDPTDD DD statement.

N

Does not enable checkpoint restart processing. When the job step ends, the checkpoint file is reset.

C

Enables checkpoint processing but not restart processing.

The following optional parameters can be specified as subparameters for `Y` or `C`. These optional parameters are ignored when used with parameter `N`.

HASH

Specifies whether to run the restart processing based on the type of the pointer error detected by HASH Check.

- When the detected pointer error is an unidentified error, the restart processing is run.
- When the detected pointer error is a severe error, the restart processing is not run.

You can check the type of the pointer errors in the Image Copy Process Summary report.

If the HASH subparameter is not specified, pointer errors that are detected by HASH Check are not considered in the restart processing.

COUNT=*nn*

Specifies the maximum number for restart attempts. *nn* is a value in the range of 1 - 99. When the number of restart attempts exceeds this value, no more restart processing is done, and the checkpoint file will be reset.

Default value

- If a valid checkpoint data set is provided with the CHKPTDD DD statement, RESTART=(Y,COUNT=5).
- If there is no valid checkpoint data set, RESTART=N.

Usage notes

This keyword operates at the job-step level. Multiple image copy job steps require multiple Checkpoint Restart data sets, one for each job step.

In order for a restart to begin, the image copy environment must be precisely the same as the one existing at the time of the checkpoint. If any image copies have been added or subtracted, the restart is invalidated.

When a restart is initiated, all databases or stacks that failed will be image copied again, including any jobs that were restarted previously. DBDSs or stacks which have successfully completed image copies, will be bypassed. The unit of restart is specified by the RSTTYPE keyword and the behavior of the restart processing is specified by the RSTTYPE_STK keyword.

If you want to cancel the restart processing, you must discard the current checkpoint record in the checkpoint file that is specified on the CHKPTDD DD statement. To discard current checkpoint record, you must delete the checkpoint file or run IMS HP Image Copy job with RESTART=C or RESTART=N.

If a *severe* pointer error is detected in RESTART=(Y,HASH) processing, the database will not be restarted. In this case, you must check the error in the database and, if needed, repair the database. To reprocess the database that had a severe error with the Checkpoint Restart function, you must recreate the checkpoint file with the preceding method.

RETCDDSN keyword

The RETCDDSN keyword specifies the name of the data set that contains HPSRETCD control statements, which define the return codes of IMS HP Image Copy processes.

If you specify this keyword, IMS HP Image Copy attempts to allocate the data set dynamically. For information about the HPSRETCD control statements, see "HPSRETCD control statement" on page 270.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

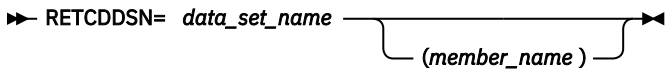
Site default option

Supported

Related keyword

None.

Format



data_set_name

Specifies the name of the data set that contains the HPSRETCD control statements.

member_name

If you specify the HPSRETCD control statements in a partitioned data set member, specify the member name. IMS HP Image Copy assumes that the data set is a sequential file unless you specify a member name.

Default value

None.

RETPD keyword

The RETPD keyword specifies the RETPD (retention period) parameter for the output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Site default option

Supported

Related keyword

None.

Format

nnnn

The retention period for the output image copy.

Default value

None.

Usage notes

- If you specify FASTIC=(,COPY), this keyword is ignored.
- The EXPDT keyword and the RETPD keyword are mutually exclusive in a statement.

RETPD2 keyword

The RETPD2 keyword specifies the RETPD (retention period) for the secondary output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Site default option

Supported

Related keyword

None.

Format

nnnn

The retention period for the output image copy.

Default value

None.

RETPD*n* keyword

The RETPD*n* keyword specifies the RETPD (retention period) for the third to seventh output image copy data sets.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

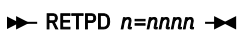
Site default option

Supported

Related keyword

None.

Format



n

Use RETPD*n* to specify the retention period for the *n*th image copy data set. *n* is 3 through 7. For example, use RETPD5 to specify the retention period for the fifth image copy data set.

nnnn

The retention period for the output image copy.

Default value

None.

RSTTYPE keyword

The RSTTYPE keyword specifies the unit of restart for Checkpoint Restart.

The specified value is used to determine whether the DBDSs are to be reprocessed in the next run.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

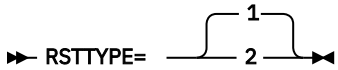
Site default option

Supported

Related keyword

“RESTART keyword” on page 227

Format



1

Image copies are reprocessed for:

- All databases that failed.
- All groups that failed.
- All stacks that failed.

2

Image copies are reprocessed for:

- In the case of DEDB, all areas that failed.
- In the case of HALDB, all partitions that failed.
- In the case of DL/I DB, all databases that failed.
- All stacks that failed.

Default value

RSTTYPE=1

Usage note

The Checkpoint Restart function works only for the primary and secondary image copy data sets. When an error is found while creating image copy data sets, the Image Copy function and the Checkpoint Restart function work as follows:

- If an error is found while creating the primary or the secondary image copy data set, the image copy processing for the database data set or area data set stops, and the data set is processed again in the restart processing.
- If an error is found while creating the third or the fourth image copy data set, the image copy processing for the database data set or area data set continues except for the image copy data set that is in error. If the processing for other image copy data sets completes, that database data set or area data set will not be a target of restart processing.

RSTTYPE_STK keyword

The RSTTYPE_STK keyword controls the behavior of the restart processing for STACK processing.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

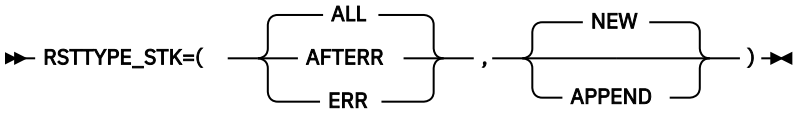
Site default option

Supported

Related keyword

- “RESTART keyword” on page 227
- “RSTTYPE keyword” on page 230
- “STACK keyword” on page 241

Format



The first operand specifies the scope of the restart processing.

ALL

When an error occurs in the STACK processing for a tape volume, IMS HP Image Copy regards all the image copy processes for that stacked tape volume have failed. In the restart processing, IMS HP Image Copy creates all image copies for that tape volume from the beginning.

AFTERR

When an error occurs in the STACK processing, IMS HP Image Copy records the error information in the checkpoint file and stops subsequent processing. In the restart processing, IMS HP Image Copy creates the image copy of the data set in which the error occurred and continues to process the subsequent database data sets. Specify AFTERR if you want to keep the order of the stacked image copy data sets in the sequence they are processed.

ERR

When an error occurs in the STACK processing, IMS HP Image Copy records the error information in the checkpoint file and, if the error is not an I/O error, continues to create image copies of other database data sets on the same tape volume. If the error is an I/O error, IMS HP Image Copy stops the processing. In the restart processing, IMS HP Image Copy creates the image copy of the database in which the error occurred. Specify ERR if you do not need to keep the order of stacked image copy data sets.

The second operand specifies how the restart processing uses tape volumes.

NEW

The restart processing creates image copy data sets on a new tape volume. Specify NEW if you want to use a new tape volume for each restart processing.

APPEND

The restart processing appends image copy data sets to the tape volume that is used in the previous run. If IMS HP Image Copy detected an I/O error in the previous STACK processing, the restart processing does not append image copy data sets to the tape volume that is used in the previous run. Instead, the restart processing creates image copy data sets on a new tape volume. If an I/O error is detected, you must replace the tape volume.

Default value

RSTTYPE_STK=(ALL,NEW)

Usage notes

- This keyword is effective only when STACK=*ddn* is specified and the data set is dynamically allocated by IMS HP Image Copy.
- If you specify RSTTYPE_STK=(,APPEND), you must check the Image Copy Stacking Process report to determine whether you need to replace tape volumes for the next restart processing.
- If you specify STACK=*, the value specified for the RSTTYPE_STK keyword is ignored. If you code the DD statement to specify the output volume for stacking image copies, IMS HP Image Copy uses that DD statement for the output and ignores the value that is specified for the RSTTYPE_STK keyword.
- If RSTTYPE_STK=(ALL,) is specified, NEW is used as the second operand regardless of the value specified for the second operand.
- You must not change the specified value on the RSTTYPE_STK keyword until the restart processing completes. If you change the value, the restart processing ends with error message FABJ4143E.
- If you specify the VOLSER keyword of IMS HP Image Copy, IMS HP Image Copy uses the tape volumes in the order that is specified on the VOLSER keyword. For example, if you specify VOLSER=(TAPE01,TAPE02,TAPE03), and TAPE01 and TAPE02 were used in the previous run of the restart processing, the next restart processing uses a different tape volume based on the value specified on the RSTTYPE_STK keyword as follows:
  - If you specify RSTTYPE_STK=(,NEW), TAPE03 will be used in the next restart processing.
  - If you specify RSTTYPE_STK=(,APPEND), TAPE02 will be used in the next restart processing.
- If all tape volumes are used in the Checkpoint Restart processing, IMS HP Image Copy uses the private volumes for the subsequent processing.

SENSOR keyword

The SENSOR keyword specifies to store sensor data in the Sensor Data repository of IMS Tools Knowledge Base (IMS Tools KB).

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

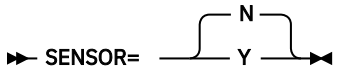
Site default option

Supported

Related keywords

- “ITKBSRVR keyword” on page 213
- “TOIXCFGR keyword” on page 259

Format



Y

Sensor records are stored in the Sensor Data repository of IMS Tools KB during the IMS HP Image Copy job. DB Sensor is internally called to collect and store sensor data.

N

Sensor data is not collected or stored.

Default value

SENSOR=N

Usage notes

- To specify SENSOR=Y, the following conditions must be met:
  - The IMS Tools Base load module data set must be concatenated to the STEPLIB DD.
  - TOSIXCFGRP, ITKBSRVR, and ADXCFGRP keywords are specified.
- The ITKBLOAD keyword is ignored when SENSOR=Y is specified.

When you use the DB Sensor function to collect sensor data from a full-function database, certain considerations apply to the collected data element values. For details, see the topic "Considerations for collecting sensor data from full-function databases" in the *IMS Solution Packs Data Sensor User's Guide*.

SENSOR_HOME keyword

The SENSOR_HOME keyword specifies whether to collect the data elements that are related to root segment distribution and store them in the Sensor Data repository of IMS Tools KB. This keyword is effective only for full-function databases.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

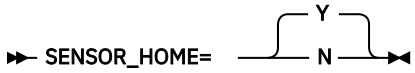
Site default option

Supported

Related keywords

- “HOMECHK keyword” on page 198
- “SENSOR keyword” on page 232

Format



Y

The data elements that are related to root segment distribution are collected and stored in the Sensor Data repository of IMS Tools KB.

The following data elements are collected when SENSOR_HOME=Y:

- DB_NUM_ROOT_NOHOME
- DB_PCT_NUM_ROOT_NOHOME
- DB_AVG_LEN_SYNONYM_CHAIN

N

The data elements that are related to root segment distribution are not collected or stored.

Default value

SENSOR_HOME=Y

Usage note

The data elements that are additionally collected when SENSOR_HOME=Y are useful factors for determining the need of database reorganization. For more information about these data elements, see the topic "GLOBAL command keywords for FF Stand-alone DB Sensor" in the *IMS Solution Packs Data Sensor User's Guide*.

- This keyword is effective when SENSOR=Y is specified. SENSOR_HOME=Y is ignored if SENSOR=N is specified or if the SENSOR keyword is not specified.
- If the key compression option of the Segment Edit/Compression exit routine is specified for the root segment, these additional data elements are not collected even when SENSOR_HOME=Y is specified.
- If you specify RMNAME=(*rand*,*rap*,0,bytes) or if you omit the third operand of the RMNAME parameter in the DBD macro, the number of root addressable area (RAA) blocks is defined as zero in the HDAM or PHDAM DBD. In this case, the additional data elements are not collected even when SENSOR_HOME=YES is specified.
- When SENSOR_HOME=Y, even if HOMECHK=N is specified, DB Sensor runs as if HOMECHK=(YES,-10,+10) is specified.

SHDWDELETE keyword

The SHDWDELETE keyword specifies when to delete shadow data sets.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

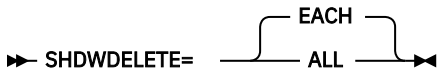
Site default option

Supported

Related keyword

“FASTIC keyword” on page 190

Format



EACH

Each shadow data set is deleted when the image copy of the data set is created.

ALL

Shadow data sets are deleted at once when all image copies are created.

Default value

SHDWDELETE=EACH

SHDWDSN keyword

The SHDWDSN keyword specifies the naming template for the shadow data sets that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

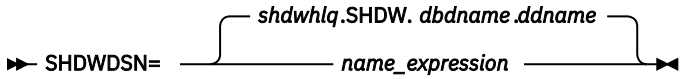
Site default option

Supported

Related keyword

- "FASTIC keyword" on page 190
- "SHDWHLQ keyword" on page 235

Format



name_expression

Specifies the naming template for shadow data sets.

You can specify the data set name by using symbolic variables, or non-variable alphanumeric or national characters ($ # @). Each symbolic variable is replaced with its related value at run time to form a specific data set name. When used in an SHDWDSN expression, a substitution variable begins with an ampersand sign (&) and ends with a period (.).

The following list shows available symbolic variables for the SHDWDSN keyword:

- &DBD
- &DBD(*n*,*length*)
- &PART
- &PART(*n*,*length*)
- &DDN
- &DDN(*n*,*length*)
- &IC
- &SHDWHLQ

Default value

shdwhlq.SHDW.*dbdname*.*ddname*
where:

- *shdwhlq* is the string specified by the SHDWHLQ keyword.
- *dbdname* is the DBD name of the target database data set.
- *ddname* is the DD name of the target database data set.

Usage note

The data set name generated must contain no more than 44 characters. For details, see "Data set naming template" on page 283.

SHDWHLQ keyword

The SHDWHLQ keyword specifies the data set name prefix for the shadow data sets.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

Site default option

Supported

Related keyword

- “FASTIC keyword” on page 190
- “SHDWDSN keyword” on page 235

Format

hlq

The data set name prefix for the shadow data sets for the Image Copy function, or is used to set a value in &SHDWHLQ, which is used by the SHDWDSN keyword.

Default value

None.

Usage notes

- MVS™ naming convention requires that a generated shadow data set name contain 44 or fewer characters:
  - When you use &SHDWHLQ on the SHDWDSN keyword, specify a shadow data set prefix containing 44 or fewer characters.
  - When you do not use the SHDWDSN keyword, specify a shadow data set prefix containing 21 or fewer characters. This prefix is used as the high-level qualifier of the data set name as follows:
    - When SHDWHLQ is specified, *shdwhlq*.SHDW.*dbdname*.*ddname*
    - When SHDWHLQ is not specified, SHDW.*dbdname*.*ddname*
- This prefix must conform to the normal data set naming standards; it can include periods, but must not end with a period.
- If this keyword is left blank, the shadow data set name prefix is not assigned.

SHDWMGMTCL keyword

The SHDWMGMTCL keyword specifies the name of the management class for the new SMS-managed shadow data sets that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

Site default option

Supported

Related keyword

"FASTIC keyword" on page 190

Format

management_class_name

The name of the management class to be used for allocating shadow data sets. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

An ACS routine can override the management class for shadow data set that you specify for the SHDWMGMTCL keyword.

SHDWSTORCL keyword

The SHDWSTORCL keyword specifies the name of the storage class for the new SMS-managed shadow data sets that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

Site default option

Supported

Related keyword

"FASTIC keyword" on page 190

Format

storage_class_name

The name of the storage class to be used for allocating shadow data sets. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

An ACS routine can override the storage class that you specify for the SHDWSTORCL keyword.

SHDWTCTL keyword

The SHDWTCTL keyword specifies the maximum number of shadow data set creation tasks that can run in parallel.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

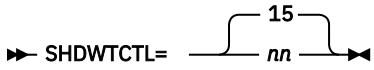
Site default option

Supported

Related keyword

“FASTIC keyword” on page 190

Format



nn

The maximum number of shadow data set creation tasks that can run in parallel. *nn* must be in the range of 0 - 64. When the specified value is 0, it means SHDWTCTL=64.

Default value

SHDWTCTL=15

Usage note

Shadow data set is created by the COPY command of DFSMSdss or EMC TimeFinder when the COPY or FDUMP process of Advanced Image Copy Services is used. You might need to adjust appropriate SHDWTCTL value in your system environment not to exceed its capacity.

SHDWVOLSER keyword

The SHDWVOLSER keyword specifies the volume serial number of the DASD volume on which the shadow data sets are created.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

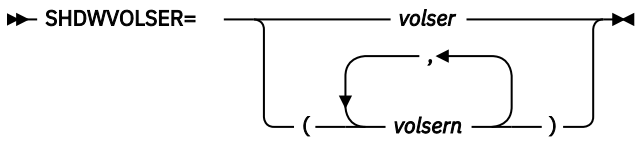
Site default option

Not supported

Related keyword

“FASTIC keyword” on page 190

Format



volser

volsern

The volume serial number of the DASD volume allocated to the SHADOW data sets.

Default value

None.

SHDW_ERROR keyword

The SHDW_ERROR keyword specifies whether the image copy processing continues or stops when the creation of the shadow data set fails.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

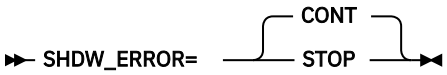
Site default option

Not supported

Related keyword

"FASTIC keyword" on page 190

Format



CONT

Processing continues even if the creation of the shadow data sets fails.

STOP

Processing stops when the creation of the shadow data sets fails.

Default value

SHDW_ERROR=CONT

Usage note

This keyword is effective only when FASTIC=(*opt*,FDUMP) is specified.

SPACE keyword

The SPACE keyword specifies the space parameter for the output image copy data set for dynamic allocation.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

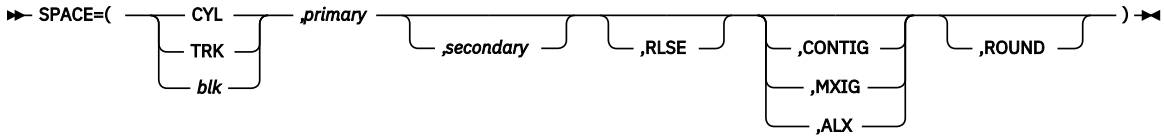
Site default option

Supported

Related keyword

None.

Format



CYL | TRK | *blk*

Specifies how the Image Copy function is to allocate the output image copy data set.

CYL

Is the allocation in cylinders.

TRK

Is the allocation in tracks.

blk

Is the allocation in blocks. For example: SPACE=(1024,10,10).

primary

Is the number of tracks, cylinders, or blocks to be allocated.

secondary

Is the additional number of tracks or cylinders to be allocated, if more are needed. If this subparameter is specified, it must locate in the third.

RLSE

Requests that space allocated to an output data set but not used, is to be released when the data set is closed.

CONTIG

Requests that space allocated to the data set must be contiguous.

MXIG

Requests that space allocated to the data set must be (1) the largest area of available contiguous space on the volume and (2) equal to or greater than the primary quantity.

ALX

Requests that space allocated to the data set is the largest five areas of available contiguous space on the volume.

ROUND

When the first subparameter specifies the average block length, this parameter requests that space allocated to the data set must be equal to an integral number of cylinders.

See the *z/OS® MVS™ JCL Reference* for details about each value.

Default value

None.

Usage note

- Output device under SMS:
  The SPACE parameter in the SMS definition is used as the default.

  If you specify the SPACE keyword in the ICEIN control statement or the site default table, the SMS definition is overwritten by the specified SPACE parameters.
- Non-SMS output device:
  The SPACE keyword is a required parameter.

  If you omit this keyword, dynamic allocation will fail. If you defined SPACE in the site default table, IMS HP Image Copy uses the SPACE parameter in the site default.

SPMN keyword

The SPMN keyword specifies whether to invoke the Space Monitor function of IMS HP Pointer Checker to monitor the database data sets.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

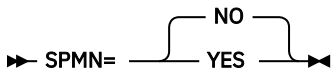
Site default option

Supported

Related keywords

- “HDPC keyword” on page 196
- “TOIXCFGR keyword” on page 259

Format



YES

Calls Space Monitor.

NO

Does not call Space Monitor.

Default value

SPMN=NO

Usage note

This keyword is effective when HDPC=Y is specified.

STACK keyword

The STACK keyword requests image copy stacking. This keyword specifies the ddname of the output stacks.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Either the ICOUT or the STACK keyword is required in these statements.

Site default option

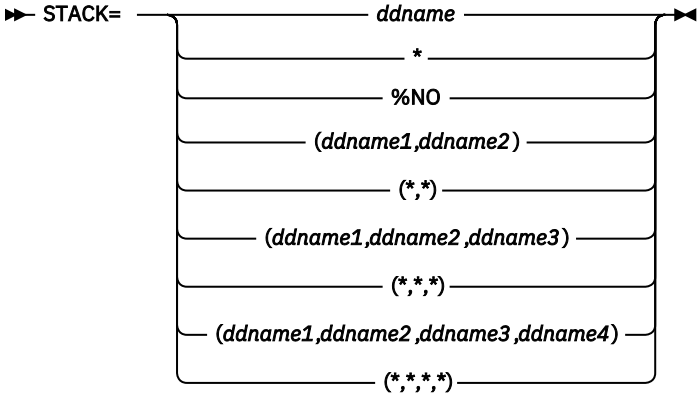
Supported

Related keyword

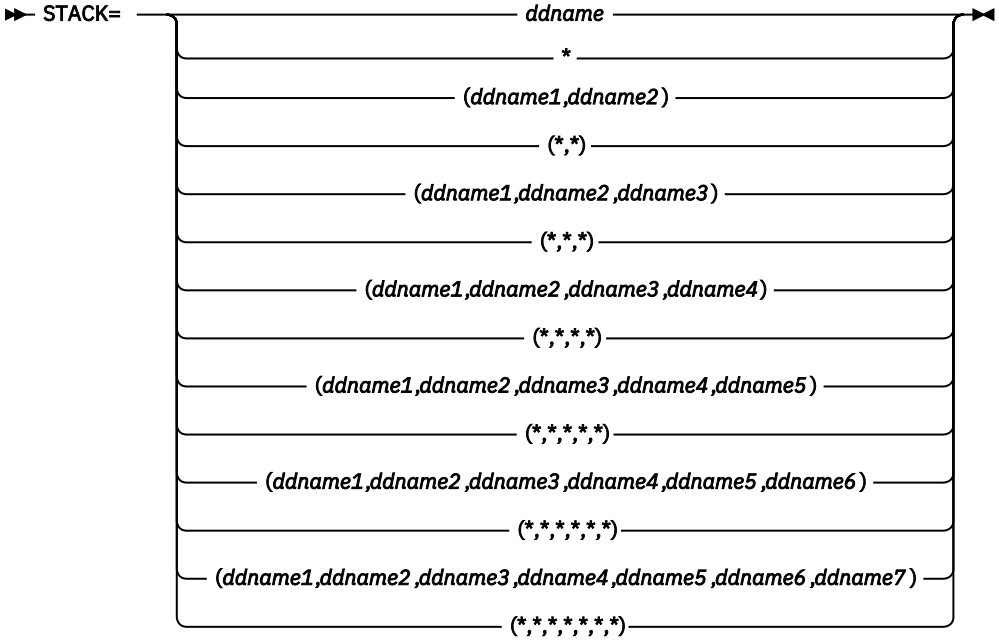
“STACKBASE keyword” on page 243

Format

For the Image Copy function:



For the Create Image Copy function:



ddname

Requests a single copy of the stacked image copy output.

ddname1

The DD name of the primary output data set.

ddname2

The DD name of the secondary output data set.

ddname3

The DD name of the third output data set.

ddname4

The DD name of the fourth output data set.

ddname5-ddname7

The DD name of the associated numbers of output data sets.

> **Note:** *ddname5*, *ddname6*, and *ddname7* are supported only for the Create Image Copy function.

*****

Specifies that the DD name of the output image copy is determined internally.

(*,*)

Used when a dual copy is requested and specifies that the DD name is determined internally.

%NO

Runs HASH Check but does not create output image copy data sets. This parameter is supported only for the Image Copy function.

Default value

None.

Usage notes

- The ICOUT and the STACK keywords are mutually exclusive.
- STACK=%NO cannot be specified in the site default table.
- If STACK=%NO is specified for all databases when the Hash Check option is not requested, the image copy processing ends with a return code of 16, and error message FABJ0252E is issued.
- Checkpoint Restart cannot be used for the database or the area when STACK=%NO. Even when Checkpoint Restart is requested and a process error is found during the job, the database or the area is not reprocessed by Checkpoint Restart.
- When one of the following conditions is met, the maximum number of image copy data sets that the Image Copy function can create for each database data set in a single run is two.
  - Fast Recovery image copy format of Advanced Image Copy Services is requested (FASTIC=(*opt*,COPY))
  - IMS HP Image Copy process is called from one of the following IMS Tools:
    - IMS Database Recovery Facility
    - Parallel Reorganization Service of IMS Database Reorganization Expert
    - IMS HP Fast Path Utilities
    - IMS Online Reorganization Facility
    - IMS HALDB Toolkit
- When stacking is enabled, IMS HP Image Copy dynamically allocates a dummy data set. For the name assigned to the dummy data set, see "Using the STACK keyword (stacking image copy data sets)" on page 278.

STACKBASE keyword

The STACKBASE keyword specifies whether to use a temporary name or the actual name when dynamically allocating the dummy data set used for stacking.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

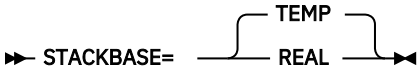
Site default option

Supported

Related keyword

"STACK keyword" on page 241

Format



TEMP

A dummy data set for stacking is allocated by using a temporary name.

When TEMP is specified, the temporary name is determined as follows:

```
DSN=ichlq.ddname.job-no.Thhmmss
```

REAL

A dummy data set for stacking is allocated by using the actual name, which is the same name as the output image copy data set.

Default value

STACKBASE=TEMP

Usage note

When stacking is enabled, IMS HP Image Copy dynamically allocates a dummy data set. For the name assigned to the dummy data set, see "Using the STACK keyword (stacking image copy data sets)" on page 278.

STORCLAS keyword

The STORCLAS keyword specifies the name of the storage class for the new SMS-managed image copy output data set that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

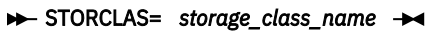
Site default option

Supported

Related keyword

None.

Format



storage_class_name

The name of the storage class to be used for allocating the data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

An ACS routine can override the storage class that you specify for the STORCLAS keyword.

STORCLAS2 keyword

The STORCLAS2 keyword specifies the name of the storage class for the new SMS-managed secondary image copy output data set that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Site default option

Supported

Related keyword

None.

Format

storage_class_name

The name of the storage class that is to be used to allocate a data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

An ACS routine can override the storage class that you specify for the STORCLAS2 keyword.

STORCLAS*n* keyword

The STORCLAS*n* keyword specifies the name of the storage class for the new SMS-managed third to seventh image copy output data sets that IMS HP Image Copy dynamically allocates.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

Site default option

Supported

Related keyword

None.

Format

n

Use STORCLAS*n* to specify the storage class for the *n*th image copy data set. *n* is 3 through 7. For example, use STORCLAS5 to specify the storage class for the fifth image copy data set.

storage_class_name

The name of a storage class that is to be used to allocate a data set. This 1- to 8-character name is defined by the storage administrator at your installation site.

Default value

None.

Usage note

ACS routine can override the storage class that you specify for the STORCLAS*n* keyword.

TASKCTL keyword

The TASKCTL keyword specifies the maximum number of IC tasks that can run in parallel.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

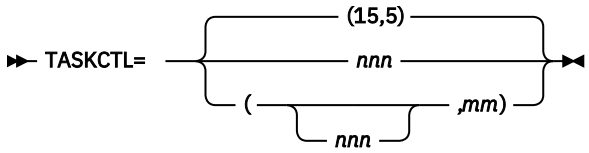
Site default option

Supported

Related keyword

"GRPLIM keyword" on page 194

Format



nnn

The maximum number of IC tasks that can run in parallel.
The value must be in the range of 0 - 253. When the specified value is 0, it means TASKCTL=253. The default value is 15.

If the specified database data set is of a HALDB and the database is flagged as ONLINE REORG CAPABLE in DBRC, IMS HP Image Copy automatically determines the ACTIVE DBDS and uses the active DBDS ddname as its input.

mm

The maximum number of tasks that can run in parallel for creating the secondary image copy data set and running HASH Check. This parameter is effective when the COPY process of Advanced Image Copy Services is used. The value must be in the range of 0 - 64. When the specified value is 0, it means TASKCTL=(,64). The default value is 5.

Default value

TASKCTL=(15,5)

Usage note

If you specify TASKCTL on the GLOBAL statement and GRPLIM on the GROUP statement, the total maximum task number is determined as follows:

- If the total of the numbers specified on the GRPLIM keywords is less than the number specified on the TASKCTL keyword, the number of tasks run in parallel will be the total of the numbers that are specified by the GRPLIM keywords.

- If the total of the GRPLIM numbers is larger than the TASKCTL number, the number of tasks run in parallel will be that specified by the TASKCTL keyword.

For example, if the following keywords are specified, six tasks are assigned for group CAG1, and four tasks are assigned for group CAG2.

```
GLOBAL TASKCTL=10
GROUP  GRPLIM=6,CAGRP=CAG1
GROUP  GRPLIM=6,CAGRP=CAG2
```

THRESHOLDS keyword

The THRESHOLDS keyword specifies the threshold values for monitoring database status with the Space Monitor function of IMS HP Pointer Checker.

This keyword is effective when both HDPC=Y and SPMN=Y are specified.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

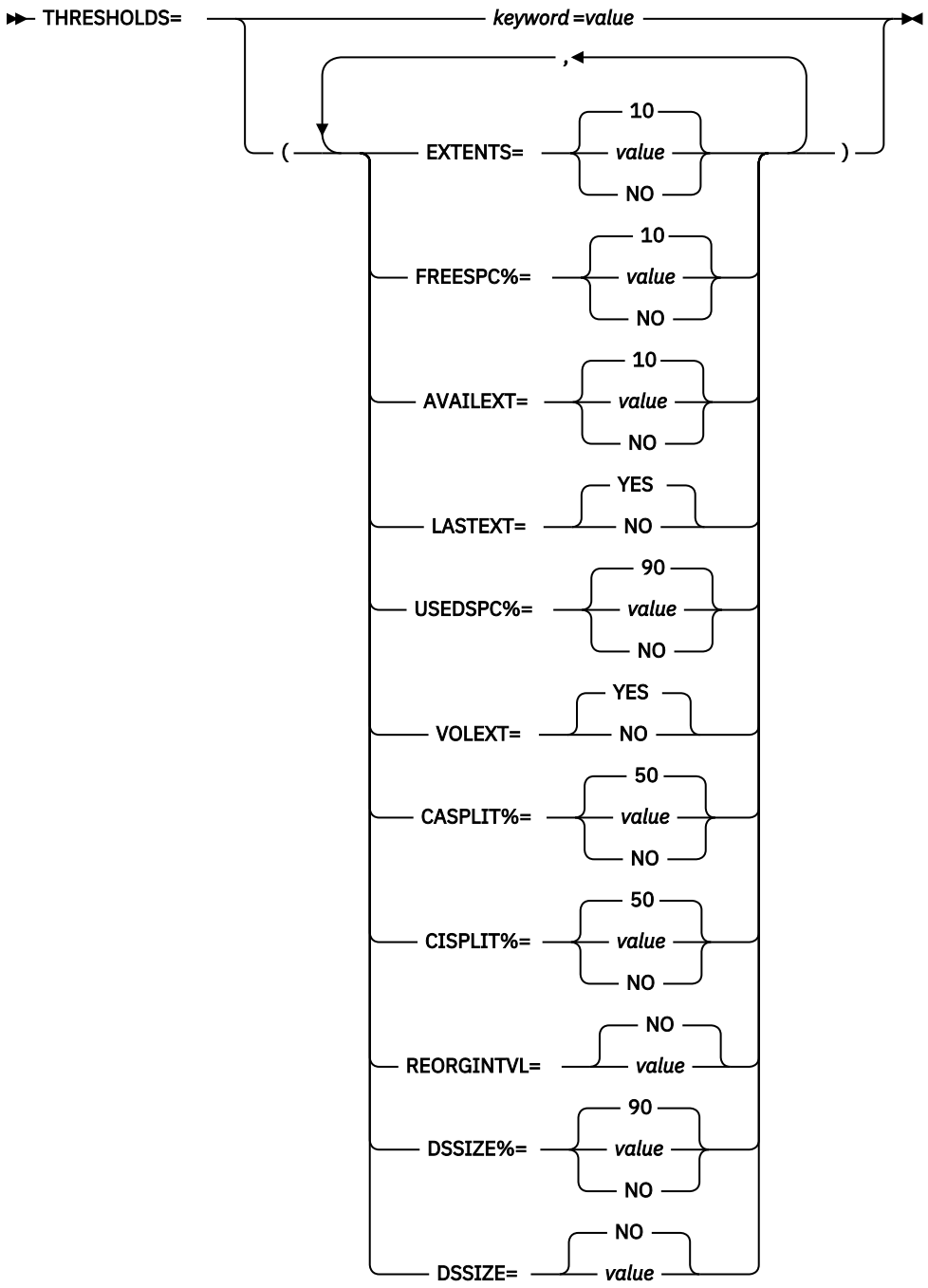
Site default option

Supported

Related keyword

“HDPC keyword” on page 196

Format



EXTENTS=0-99|NO

Specifies the warning threshold value for the number of extents. The default value is 10.

FREESPC%=0-100|NO

Specifies the warning threshold value for the percentage of free space. The default value is 10.

AVAILEXT=0-50|NO

Specifies the warning threshold value for the number of available extents. The default value is 10.

LASTEXT=YES|NO

If YES is specified, and the data set is using the last extent, a warning message for this data set is shown in the Space Monitor Exception report. The default value is YES.

USEDSPC%=0-100|NO

Specifies the warning threshold value for the percentage of space used. The default value is 90.

VOLEXT=YES|NO

If YES is specified, and not enough space is left on the DASD volume for the data set to extend, a warning message for this data set is shown in the Space Monitor Exception report. The default value is YES.

CASPLIT%=0-100|NO

Specifies the warning threshold value for the percentage of CA splits. The default value is 50.

CISPLIT%=0-100|NO

Specifies the warning threshold value for the percentage of CI splits. The default value is 50.

REORGINTVL=0-999|NO

Specifies the warning threshold value for the number of days that can pass without a database reorganization. The default value is NO.

DSSIZE%=0-100|NO

Specifies the warning threshold value for the percentage of the data set used space within the maximum size. The default value is 90.

DSSIZE=0-9999|NO

Specifies the warning threshold value for the data set size in the units of MB. The default value is NO.

Default value

None.

TIMECHK keyword

The TIMECHK keyword specifies whether to verify the time stamp in the image copy header record with the DBRC record.

Functions that support this keyword

- Recovery function
- Create Image Copy function

> **Note:** For the Create Image Copy function, the TIMECHK keyword is effective only when logical copy is selected.

Statements that support this keyword

- GLOBAL statement
- RCV statement
- CRC statement

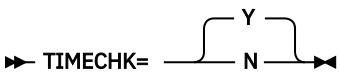
Site default option

Supported

Related keyword

None.

Format



Y

Compares the time stamp data in the header record of the input image copy data set with that in the DBRC record. If the time stamps are not the same, the IMS HP Image Copy process fails.

N

Does not compare the time stamp data in the header record of the input image copy data set with that in the DBRC record. If the input image copy data set is the same as the concurrent image copy (CIC), TIMECHK=N is ignored.

Default value

TIMECHK=Y

Usage note

The TIMECHK keyword is not effective for the following types of image copies:

- Online Image Copy
- IC2 Image Copy

TIMESTMP keyword

The TIMESTMP keyword specifies the time stamp to identify the input image copy data sets. This keyword also specifies whether to detect and use the latest batch image copy.

Functions that support this keyword

- Recovery function
- Create Image Copy function

For the Recovery function, the TIMESTMP keyword is used to specify the time stamp to be used for the time stamp recovery or to detect latest batch image copy. For more information about valid recovery time stamps, see "Time stamp recovery" on page 251. For the Create Image Copy function, the TIMESTMP keyword is used to identify the input image copy data set.

Statements that support this keyword

- GLOBAL statement
- RCV statement
- CRC statement

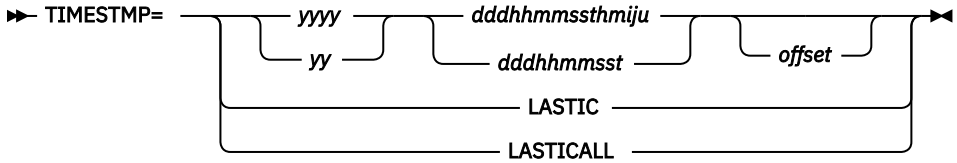
Site default option

Supported

Related keyword

None.

Format



[*yy*]*yy* | *ddd* | *hh* | *mm* | *ss* | *t* [*offset*] specifies which recovery time is used for the time stamp recovery of the Recovery function. For the Create Image Copy function, identifies the input image copy from the specific time stamp.

yyyy* or *yy

The year (1960 - 2059). If the year is specified in 2-digit form (*yy*), IMS HP Image Copy handles the specified time as follows:

- 00=<*yy*<60 as 20*yy*
- 60=<*yy*=<99 as 19*yy*

ddd

The day of the year (001 - 366).

hh

The hour (0 - 23).

mm

The minute (0 - 59).

ss

The second (0 - 59).

thmiju

The microseconds (000000 - 999999).

/

Character delimiter, which can be a colon (:) or a period (.). You can omit the delimiter.

offset

Can be one of the following:

- Omitted: The current time zone value is used.
- A numeric offset in the form *h[h[:mm]]* or *h[h[mm]]* that, when added to UTC, gives the local time. *h[h]* is a numeric value from -11 to +14. For the compressed format, *hh* must be specified if *mm* is specified for the compressed format. *mm* is a value from the set [00,15,30,45].
  - *hh:mm* is valid only between the values -11:45 to +14:45.
  - *hhmm* is valid only between the values -1145 to +1445.

If you want to specify the time for a different time zone (with daylight saving time), you must specify the time in that time zone and the offset time.

For example, to specify the recovery time UTC 2019/11/1 13:00, specify the TIMESTMP keyword as follows:

```
TIMESTMP=2019.305.13:00:00.0+0
```

LASTIC

Requests the Recovery function or the Create Image Copy function to use the latest batch image copy (IC) that is registered to the DBRC as the input.
The LASTIC keyword does not work for data sets other than batch image copy (IC) data set, such as the concurrent image copy (CIC) data sets, the IC2 (SMSNOCIC or SMSCIC) data sets, or the Online Image Copy (OIC) data sets. When these kinds of IC data sets (CIC, SMSNOCIC, SMSCIC, or OIC) are registered after the batch image copy (IC) data set is registered to DBRC, IMS HP Image Copy ignores and bypasses them, and uses the batch image copy (IC) data set as the input data set.

LASTICALL

Requests the Recovery function or the Create Image Copy function to use the latest batch image copy or SMSNOCIC that is stored in DBRC as the input.

Default value

None.

Usage notes

- If TIMESTMP=LASTIC or TIMESTMP=LASTICALL is specified for the Recovery function, the input image copy must be allocated by dynamic allocation. This statement must not be coded in JCL.
- If TIMESTMP=*timestamp* is specified for the Recovery function, use dynamic allocation for the image copy. If the image copy data set specified is not the same as that registered to DBRC, the Recovery function fails.
- All input data sets, including the image copy data sets, the log data sets, and the change accumulation data sets, must be registered to DBRC.

Time stamp recovery

To recover data sets to a specific point in time, you must provide a valid recovery time stamp with the TIMESTMP keyword. A valid recovery time stamp can be:

- If the image copy data sets that you use as input are created as batch, SMSNOCIC, or SMSOFFLC image copies, the recovery time stamp can be the time when the Image Copy job was run or any time after that.
- If the image copy data sets that you use as input are created as CIC, SMSCIC, SMSONLC, or ONLINE image copies, the recovery time stamp must be a time after the Image Copy job was run.

To recover data sets to a specific point in time, the following conditions must be satisfied:

- The job must run with DBRC=Y.
- Input image copy data sets, log data sets, and change accumulation data sets must be registered to DBRC RECON data sets.
- The recovery time stamp that you specify must meet the following conditions:
  - Database data sets were not allocated or in use at the specified recovery time stamp.
  - The online log data set (OLDS) must be closed at the specified recovery time stamp, and is archived to the SLDS (system log data set) or RLDS (recovery log data set) before the specified recovery time stamp.
  - If a change accumulation data set is used, the change accumulation data set must be created before the specified recovery time stamp.

Examples

Use the following examples to specify the TIMESTMP keyword:

- For 2019 September 9, 8:24:45.7 in local time, specify as:

```
TIMESTMP=20192520824457
```

- For 2019 June 17, 14:32:24:0 in local time, specify as:

```
TIMESTMP=2019.168.14.32.24.0
```

- For 2019 February 5, 17:02:15.8 in local time, specify as follows if the zone offset is 8:00:

```
TIMESTMP=2019.036.17.02.15.8+8
```

- For 2019 December 31, 23:38:01.3 in local time, specify as follows if the zone offset is -4:30:

```
TIMESTMP=193652338013-4:30
```

- To request LASTIC recovery, specify as:

```
TIMESTMP=LASTIC
```

TOIAUTO keyword

The TOIAUTO keyword specifies whether IMS Tools Online System Interface issues IMS commands to stop and start the database before and after the batch image copy process.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement

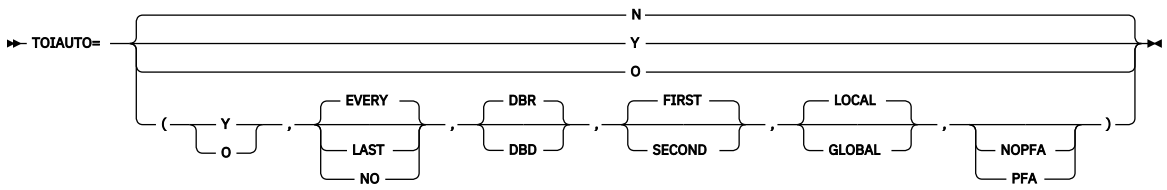
Site default option

Supported

Related keywords

- “DBRC keyword” on page 178
- “TOIXCFGR keyword” on page 259

Format



Y

Stops the database before the batch image copy process, then starts the database after the batch image copy process.

N

Does not stop or start the database.

O

Stops the database before the batch image copy process, but does not start the database after the batch image copy process.

The following optional parameters are applicable only when the first parameter is Y or O. These optional parameters can be specified only on the GLOBAL statement.

EVERY

Switches the log to the next OLDS and takes a checkpoint every time the database is stopped. EVERY is the default.

LAST

Switches the log to the next OLDS and takes a checkpoint only when the last IMS command is issued to stop the database. If the GLOBAL parameter is specified, LAST is ignored.

NO

Indicates that the log is not to be switched to the next OLDS and that a checkpoint is not to be taken when the database is stopped.

> **Note:** EVERY, LAST, and NO are mutually exclusive.

DBR

Issues the /DBRECOVERY command to stop the full-function database, HALDB, and DEDB. DBR is the default.

DBD

Issues the /DBDUMP command to stop the full-function database and HALDB. When specified for a DEDB, this option is ignored.

> **Note:** DBR and DBD are mutually exclusive.

FIRST

Starts the database after the primary image copy process ends. FIRST is the default.

SECOND

Starts the database after the secondary image copy process ends.

> **Note:** FIRST and SECOND are mutually exclusive. They are effective when the secondary image copy data set is requested with Fast Recovery image copy format of the Advanced Image Copy Services.

LOCAL

Issues the /DBRECOVERY, /DBDUMP, and /START commands to each subsystem independently.

- A /DBRECOVERY or /DBDUMP command is issued only to each subsystem that allocates the database, the area, or the HALDB partition in exclusive mode or update mode.

- A /START command is issued to each subsystem to which IMS HP Image Copy issued the /DBRECOVERY or the /DBDUMP command.

LOCAL is the default.

> **Note:** If LOCAL is applied, IMS HP Image Copy identifies all the subsystems that allocate the database, the area, or the HALDB partition in exclusive mode or update mode and issues the IMS commands to those subsystems that were identified. If no subsystems match these criteria, IMS commands are not issued to any of the subsystems. If you want IMS HP Image Copy to always issue the /DBRECOVERY or the /DBDUMP command regardless of the condition, specify the GLOBAL parameter.

GLOBAL

Issues the /DBRECOVERY, /DBDUMP, and /START commands with the GLOBAL keyword for the database or the area, which means that these IMS commands apply to all online subsystems that share the database, the area, or the HALDB partition.

> **Note:** LOCAL and GLOBAL are mutually exclusive.

NOPFA

Issues the /DBR GLOBAL and /DBD GLOBAL commands with the NOPFA keyword when both GLOBAL and NOPFA are specified. If the GLOBAL parameter is not specified, NOPFA is ignored.

PFA

Issues the /DBR GLOBAL and /DBD GLOBAL commands without the NOPFA keyword when both GLOBAL and PFA are specified. If the GLOBAL parameter is not specified, PFA is ignored.

Default value

- If TOIAUTO is not specified, the default is TOIAUTO=N.
- If TOIAUTO=Y is specified, the default is TOIAUTO=(Y, EVERY, DBR, FIRST).
- If TOIAUTO=O is specified, the default is TOIAUTO=(O, EVERY, DBR, FIRST).

Usage notes

- To specify TOIAUTO=Y, DBRC=Y is required. Also, all the load libraries of IMS HP Image Copy, the IMS Tools Online System Interface, and IMS HP Image Copy site default module must be APF-authorized.
- If this keyword is specified on the GROUP or GLOBAL statement, it applies to IC/AIC control statements, only. If this keyword is specified in multiple IC/AIC statements for each database data set of the same database, the first setting is effective for the entire database. TOIAUTO works for full-function, HALDB, and Fast Path databases.
- IMS command process run by IMS Tools Online System Interface must meet the following conditions:
  - DBRC=Y is required.
  - Database data set or area must be registered to DBRC.
- If TOIAUTO=Y or O is specified but the target IMS is not online, IMS HP Image Copy continues processing as TOIAUTO=N.
- The following considerations apply to the GLOBAL parameter:
  - IRLM must be active. If IRLM is not active, the command is rejected. For more information, see *IMS Commands*.
  - Even if the database data set or the area is not registered to DBRC, the /DBR GLOBAL, /DBD GLOBAL, and /STA GLOBAL commands are issued.
  - Even if the /DBR GLOBAL or the /DBD GLOBAL command fails, the image copy processing continues.
  - If both the GLOBAL and the LAST parameters are specified, LAST is replaced with EVERY.

- If TOIAUTO=O is specified without the NOPFA parameter, the database or the area is stopped and authorization processing for data sharing is prohibited. To permit authorization processing for data sharing for the database or the area, use the /STA DB GLOBAL command to start the database or the area.

TOIAUTO_Q keyword

The TOIAUTO_Q keyword specifies whether IMS Tools Online System Interface issues database quiesce commands before and after the batch image copy process.

This keyword is effective for the batch image copy process and when the IMS Tools Online System Interface is used.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

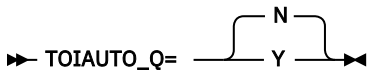
Site default option

Supported

Related keywords

- “DBRC keyword” on page 178
- “TOIXCFGR keyword” on page 259

Format



Y

Issues database quiesce commands before and after the batch image copy process.

N

Does not issue any database quiesce commands.

Default value

TOIAUTO_Q=N

Usage notes

- To apply TOIAUTO_Q=Y, the following conditions must be satisfied:
  - All the load libraries of IMS HP Image Copy and the IMS Tools Online System Interface, and IMS HP Image Copy site default module are APF-authorized.
  - IMS Type 2 command is available through the OM API.
  - DBRC=Y is specified. If DBRC=N is specified, IMS HP Image Copy does not issue database quiesce commands.
  - Database data set or area data set is registered to DBRC.
  - MINVERS of the RECON data set is 11.1 or higher.
  - TOIXCFGR keyword is specified.
  - While the IMS HP Image Copy job is running with TOIAUTO_Q=Y, you must not manually issue any database quiesce commands. If you manually issue database quiesce commands, an unexpected result might be encountered.
- TOIAUTO_Q=Y is ignored when specified with the following statements:
  - RCV (Recovery function)
  - CRC (Create Image Copy function)
  - CIC (concurrent image copy)

- ACIC (concurrent image copy)
- GROUP statements that contain FUNC=CIC, FUNC=ACIC, or FUNC=CRC keyword

- The TOIAUTO keyword and TOIAUTO_Q=Y are mutually exclusive.
- The following considerations apply to the database quiesce function:
  - If the database was already quiesced by another program, IMS HP Image Copy will not release the quiesce on the database after the IMS HP Image Copy job step ends.
  - If a quiesce command fails for the database, IMS HP Image Copy will not create image copies of the database.
  - In the restart processing of the Checkpoint Restart function, IMS HP Image Copy will not issue database quiesce commands for the database that was successfully processed in the previous run. IMS HP Image Copy will issue database quiesce commands only for the databases that will be reprocessed.
  - To quiesce the database, IMS HP Image Copy issues an IMS Type 2 command, such as UPDATE DB or UPDATE AREA command, together with the START(QUIESCE) and OPTION(HOLD) keywords. To release the quiesce, IMS HP Image Copy issues UPDATE DB or UPDATE AREA command together with the STOP(QUIESCE) keyword.
  - IMS HP Image Copy specifies OPTION(NOFOEV) keyword when issuing an IMS Type 2 command to release the quiesce on the database. This keyword specifies that the IMS log is not switched to the next OLDS by the database quiesce and a simple checkpoint is not taken. To switch the IMS log, you must do it manually.

  For more information about the database quiesce function, see IMS publications.

TOIAUTO_STA keyword

The TOIAUTO_STA keyword specifies the offline database to start after IMS HP Image Copy creates batch image copies.

If this keyword is specified, IMS HP Image Copy issues the /START command through the IMS Tools Online System Interface to start the offline database. You can use this keyword, for example, when you want to create image copies of an offline database and then bring the database online immediately after the image copies are created.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

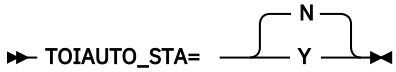
Site default option

Supported

Related keyword

- “TOITIME keyword” on page 258

Format



Y

Issues the /START command through the IMS Tools Online System Interface to start the offline database after the batch image copy process completes. This option can be applied for a database, partition, or area that was manually stopped before the IMS HP Image Copy job started.
The /START command is always issued with the GLOBAL option (/START GLOBAL).

N

Does not issue the /START command.

Default value

TOIAUTO_STA=N

Usage notes

- To specify TOIAUTO_STA=Y, the following conditions must be satisfied:
  - All the load libraries of IMS HP Image Copy and IMS Tools Online System Interface, and, if used, IMS HP Image Copy site default module must be APF-authorized.
  - DBRC must be used (DBRC=Y).
  - Database data sets or areas must be registered to DBRC.
- If TOIAUTO_STA=Y is specified but the target IMS is not online, IMS HP Image Copy continues processing as TOIAUTO_STA=N.
- IRLM must be active. If IRLM is not active, the command is rejected. For more information, see the descriptions of /START commands in *IMS Commands*.

TOIRETRY keyword

The TOIRETRY keyword specifies whether IMS HP Image Copy reissues the IMS command to stop the database. The keyword also specifies the maximum number of retries.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

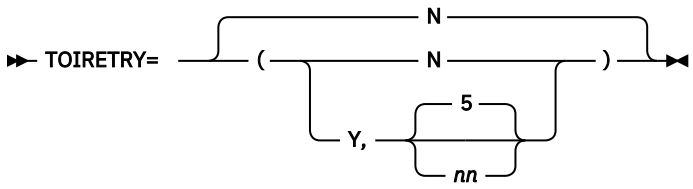
Site default option

Supported

Related keyword

“TOIAUTO keyword” on page 252

Format



N

Does not reissue the IMS command to stop the database.
If a command reply from IMS is not returned by the time that is specified by the TOITIME keyword, IMS HP Image Copy continues the process. If IMS HP Image Copy can take the authorization of the database without receiving the command reply, IMS HP Image Copy continues to create image copy data sets.

Y

If a command reply from IMS is not returned within the maximum allowable time that is specified by the TOITIME keyword, IMS HP Image Copy reissues the IMS command until the maximum number of retries is reached. The maximum number of retries is specified as the second operand (*nn*).

nn

The maximum number of retries in the range of 1 - 99. This value is effective when the first operand is Y. If you do not specify the maximum number of retries, the maximum number of retries is set to 5.

Default value

TOIRETRY=N

TOITIME keyword

The TOITIME keyword specifies the time value that is used to retrieve the response from the IMS Tools Online System Interface.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

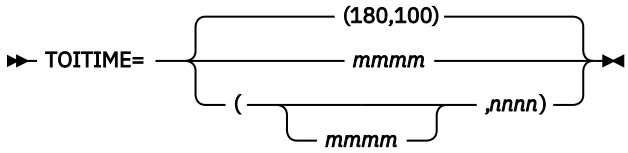
Site default option

Supported

Related keyword

"TOIAUTO keyword" on page 252

Format



mmmm

Specifies, in seconds, the maximum allowable time until IMS HP Image Copy detects the stop of a database. Value must be in the range of 1 - 9999.

nnnn

Specifies, in milliseconds, the time interval for /DIS AREA, which is used to check whether the DEDB area has stopped or not. Value must be in the range of 1 - 9999.

Default value

TOITIME=(180,100)
The default value for the second parameter is 100, which means 0.1 seconds.

Usage note

The time you specify for the first parameter must be equal to or longer than that of the second parameter. For example, if you specify TOITIME=(1,*nnnn*), you can specify 1 - 1000 for the second operand.

TOITIME_Q keyword

The TOITIME_Q keyword specifies the timeout value for IMS database quiesce commands.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

Site default option

Supported

Related keyword

"TOIAUTO_Q keyword" on page 255

Format

nnn

Specifies, in seconds, the timeout value for IMS database quiesce commands. The value is in the range of 1 - 999.

Default value

If TOITIME_Q is not specified, the default value depends on your IMS environment because IMS HP Image Copy allows IMS to set the value. For the default value of IMS, see the description of the database quiesce function in *IMS Database Administration*.

Usage note

- The specified value is used for the SET(TIMEOUT(*nnn*)) parameter of the UPDATE DB or UPDATE AREA command for database quiesce. The value specifies the timeout interval for IMS to wait for application programs to commit their updates before IMS cancels the quiesce process. If IMS cancels the quiesce process, which means the database quiesce command fails, IMS HP Image Copy skips the image copy processing for the database.
- TOITIME_Q is effective only when TOIAUTO_Q=Y is specified.

TOIXCFGR keyword

The TOIXCFGR keyword identifies the XCF group that the IMS Tools Online System Interface uses to interface with IMS HP Image Copy. The TOIXCFGR keyword and the TOSIXCFGRP keyword are functionally identical.

This keyword is required if you are using the IMS Tools Online System Interface functions and the DB Sensor function.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

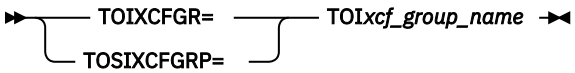
Site default option

Supported

Related keywords

- “SENSOR keyword” on page 232
- “SPMN keyword” on page 240
- “TOIAUTO keyword” on page 252
- “TOIAUTO_Q keyword” on page 255

Format



TOI

The prefix name of the XCF group name. Always specify the prefix TOI to use IMS Tools Online System Interface and to identify the specific XCF group name.

xcf_group_name

Indicates the XCF group name. The group name is a 1- to 5-alphanumeric character string that the IMS Tools Online System Interface prefixes with the characters TOI, to produce the XCF group name.

Default value

None.

Usage notes

The TOIXCFGR keyword and the TOSIXCFGRP keyword are functionally identical.

- In IMS HP Image Copy reports and messages, `TOIXCFGR` is displayed even when TOSIXCFGRP is specified.
- On the GLOBAL statement or in the site default table, TOIXCFGR and TOSIXCFGRP are exclusive; only one of these keywords can be specified.

- TOIXCFGR or TOSIXCFGRP specification on the GLOBAL statement replaces the TOIXCFGR or TOSIXCFGRP specification in the site default table.

When you use the DB Sensor function to collect sensor data from a full-function database, certain considerations apply to the collected data element values. For details, see the topic "Considerations for collecting sensor data from full-function databases" in the *IMS Solution Packs Data Sensor User's Guide*.

TOSIXCFGRP keyword

The TOSIXCFGRP keyword identifies the XCF group that the IMS Tools Online System Interface uses to interface with IMS HP Image Copy. This keyword functions identically to the TOIXCFGR keyword.

T2CHK keyword

The T2CHK keyword specifies the two threshold values that are used by the HD Pointer Checker HASH pointer check option to define how the slack bytes or unknown data is treated as T2 records.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

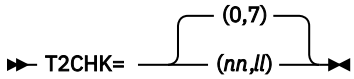
Site default option

Supported

Related keyword

“HDPC keyword” on page 196

Format



nn

Specify, in the range of 0 - 99, the maximum number of T2 records (whose length is longer than the length specified on the second parameter) that are ignored (suppressed) and not regarded as errors. If the number of generated T2 records exceeds the threshold value, all T2 records are regarded as errors.

This option is effective only for HISAM, HDAM, HIDAM, PHDAM, and PHIDAM databases.

ll

Specify, in the range of 1 - 99, the maximum length of T2 that is not regarded as an error.
This option is effective only for HDAM and HIDAM databases. The option, if specified for a HISAM database, does not cause an error, but is ineffective.

Default value

T2CHK=(0,7)

Examples

T2CHK=(,3) is equivalent to T2CHK=(0,3). T2CHK=(10,) is equivalent to T2CHK=(10,7). T2CHK=(10) is equivalent to T2CHK=(10,7).

UNIT keyword

The UNIT keyword specifies the UNIT parameter for the allocation of the output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

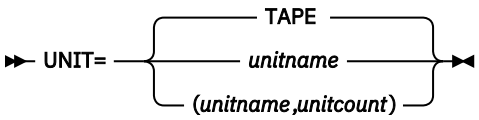
Site default option

Supported

Related keyword

None.

Format



unitname

(*unitname*,*unitcount*)

The UNIT parameter for allocating the output image copy data set. For example, UNIT=TAPE or UNIT=(TAPE,2).

Default value

UNIT=TAPE

UNIT2 keyword

The UNIT2 keyword specifies the UNIT parameter for allocation of the secondary output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

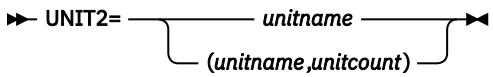
Site default option

Not supported

Related keyword

None.

Format



***unitname* or (*unitname,unitcount*)**

The UNIT parameter for allocating the secondary output image copy data set. For example, UNIT2=TAPE or UNIT2=(TAPE,2).

Default value

None.

Usage note

If both UNIT2 and STORCLAS are specified, the value specified on the STORCLAS keyword is not applied to the secondary output image copy data set.

USER keyword

The USER keyword specifies the TSO user IDs to which the HD Pointer Checker utility sends a notification message when a pointer error or a T2 error is detected.

Functions that support this keyword

Image Copy function

Statements that support this keyword

GLOBAL statement

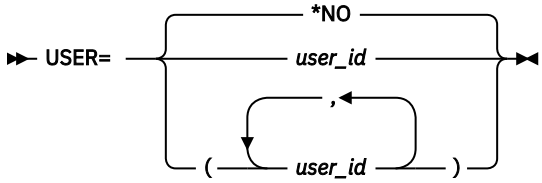
Site default option

Supported

Related keyword

"HDPC keyword" on page 196

Format



***NO**

Notification message will not be sent to any TSO users.

user_id

(*user_id1* ,*user_id2*,....)

Specify up to 20 TSO user IDs. If the specified TSO user is not logged on to TSO or is disconnected from the terminal, the message will be discarded.
This keyword can also specify the special value *JOBUSR as one of these user IDs. This value will be converted to the user ID of the submitter of the job.

Default value

USER=*NO

Usage notes

- If an incorrect TSO user ID is specified, HD Pointer Checker attempts to send the notification message to the TSO user and the message will be discarded.
- The SUMMARY DD statement is required for sending notification messages.

VIC keyword

The VIC keyword specifies whether to process virtual image copies for primary and secondary index databases.

This keyword also specifies whether to run HASH Check for the index database when processing a virtual image copy.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement

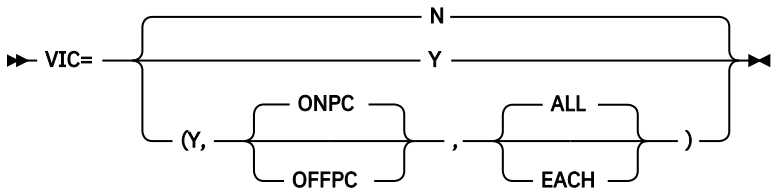
Site default option

Supported

Related keywords

- “DBRC keyword” on page 178
- “HDPC keyword” on page 196
- “NOTIFYMODE keyword” on page 221
- “VICDSN keyword” on page 264

Format



Y

Specifies that the Image Copy function does not create physical image copy data sets for the primary and secondary index data sets, but registers a dummy image copy data set name to DBRC as UIC.

N

Specifies that the Image Copy function creates physical image copy data sets for primary and secondary index data sets.

ONPC

Specifies that HASH Check is executed depending on the HDPC specification. ONPC is the default value for the second parameter.

OFFPC

Specifies that HASH Check is not executed for the index database regardless of the HDPC specification.

ALL

Specifies that all UIC records of index databases are registered to DBRC at the same time. ALL is the default value for the third parameter.

EACH

Specifies that UIC records of index databases are registered to DBRC one at a time.

Default value

VIC=N

Usage notes

- If you specify NOTIFYMODE=COND, UIC records of each index database are always registered one at a time.
- If you specify ALL as a subparameter of VIC when NOTFIYMODE=COND is specified, the ALL subparameter is ignored.
- The second parameter, ONPC or OFFPC, is effective only when Y is specified for the first parameter. If the second parameter is specified on the GLOBAL statement or the site default, and is not specified on the GROUP, IC, AIC, CIC, or ACIC statement, the value of the second parameter on the GLOBAL statement or the site default is used.
- In the case of CIC with FASTIC=(,DUMP), BWO(TYPEIMS) is required for the index database. If BWO(TYPEIMS) is not specified, VIC=Y works only if the HASH Check is disabled by HDPC=N or VIC=(Y,OFFPC). Otherwise the process ends with error, RC=08.
- VIC=Y and HDPC=O are mutually exclusive.
- If DBRC=N and VIC=Y are specified, IMS HP Image Copy skips registering a dummy image copy data set name to DBRC as UIC. However, HASH Check is executed when HDPC=Y or DEDBPC=Y is specified.
- If you specify DBRC=YES and VIC=EACH, DBRC registration might take a long time and decrease performance.

VICDSN keyword

The VICDSN keyword specifies the name of the dummy data set that is used as data in the UIC record of the virtual image copy. This dummy data set will be registered to DBRC.

Functions that support this keyword

Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement

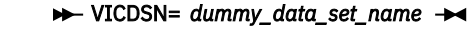
Site default option

Supported

Related keyword

"VIC keyword" on page 263

Format



dummy_data_set_name

Registers a dummy data set name to DBRC as the data set name for the NOTIFY.UIC command during the virtual image copy process.
The dummy data set name must be fewer than 45 characters.

Default value

None.

VOLCNT keyword

The VOLCNT keyword specifies the number of tape volumes used for the output image copy data set.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement

- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

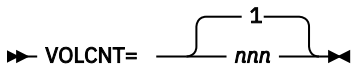
Site default option

Not supported

Related keyword

None.

Format



nnn

Specifies the maximum number of volumes that an output image copy data set requires. The volume count is a decimal number in the range of 1 - 255 for a tape data set and 1 - 59 for a DASD data set.

Default value

VOLCNT=1

VOLSER keyword

The VOLSER keyword specifies the volume serial number of the tape volume used for the primary data set of the output image copy.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

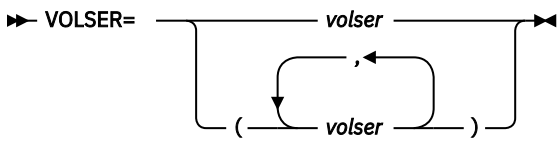
Site default option

Not supported

Related keyword

None.

Format



volser **or (*volser1,volser2,...*)**

The volume serial number of the tape or the DASD volume allocated to the primary data set of the output image copy.

Default value

None.

VOLSER2 keyword

The VOLSER2 keyword specifies the volume serial number of the tape volume used for the secondary data set of the output image copy.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

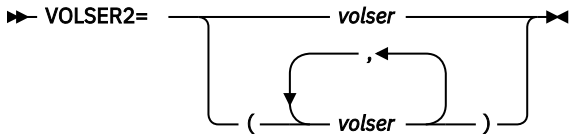
Site default option

Not supported

Related keyword

None.

Format



volser **or (*volser1,volser2,...*)**

The volume serial number of the tape volume that is allocated to the secondary data set of the output image copy.

Default value

None.

VOLSER*n* keyword

The VOLSER*n* keywords specify the volume serial number of the tape volume used for the third to the seventh data sets of the output image copy.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

- GLOBAL statement
- GROUP statement
- IC/AIC statement
- CIC/ACIC statement
- CRC statement

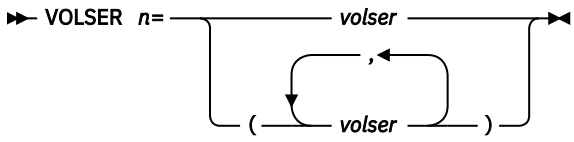
Site default option

Not supported

Related keyword

None.

Format



n

Use VOLSER*n* to specify the volume serial number for the *n*th output image copy. *n* is 3 through 7. For example, use VOLSER5 to specify the volume serial number for the fifth output image copy data set.

volser

(*volser1,volser2,...*)

The volume serial number of the tape volume that is allocated for the *n*th data set of the output image copy.

Default value

None.

WAITALOC keyword

The WAITALOC keyword specifies whether to display the WAIT option in message IEF238D when dynamic allocation on the tape unit fails.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

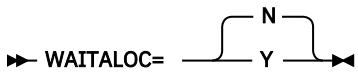
Site default option

Supported

Related keyword

None.

Format



Y

Displays the WAIT option in message IEF238D. If WAIT is replied to message IEF238D, IMS HP Image Copy waits to do dynamic allocation until the required units are released.

N

Does not display the WAIT option in message IEF238D.

Default value

WAITALOC=N

Usage note

If any of the libraries specified on the STEPLIB DD statement are not APF-authorized, WAITALOC=Y is ignored.

WAITMSG keyword

The WAITMSG keyword specifies whether to display WTO message FABJ3929A on the operator console until dynamic allocation is done on the tape unit.

This keyword is effective for the dynamic allocation (SVC99) reason codes 214, 220, 228, and 484.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

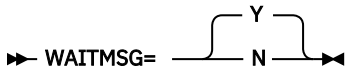
Site default option

Supported

Related keyword

"WAITTIME keyword" on page 268

Format



Y

Displays WTO message FABJ3929A on the operator console until dynamic allocation on the tape unit is successful.

N

Does not display WTO message FABJ3929A on the operator console.

Default value

WAITMSG=Y

Usage notes

- If WAITTIME=0 is specified, this keyword is not in effect.
- When CANGO is specified for WAITTIME and the reason code of dynamic allocation is 484, WTO message FABJ3929A is displayed even if WAITMSG=N is specified.

WAITTIME keyword

The WAITTIME keyword specifies the wait time for repeating the dynamic allocation on the tape unit when the dynamic allocation reason code (SVC99) is 214, 220, 228, or 484.

Functions that support this keyword

- Image Copy function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

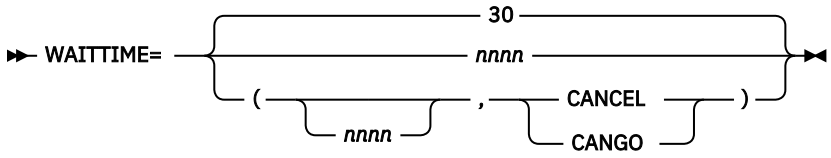
Site default option

Supported

Related keyword

"WAITMSG keyword" on page 268

Format



nnnn

The time, in minutes, for repeating the dynamic allocation on the tape unit when the reason code is 214 (device not available), 220 (requested volume not available), or 228 (specified volume or device in use by system). For more information about the reason codes, see the topic "Interpreting Error Reason Codes from DYNALLOC" in the *MVS™ Programming: Authorized Assembler Services Guide*.
The minimum value is 0 and the maximum value is 9999. 0 specifies that IMS HP Image Copy does not retry dynamic allocation and ends with a U3916 message.

CANCEL|CANGO

Specifies whether to retry dynamic allocation when the reason code is 484.

CANCEL

Does not retry dynamic allocation.

CANGO

Retries dynamic allocation.

Default value

WAITTIME=30

ZIIPMODE keyword

The ZIIPMODE keyword specifies whether IMS HP Image Copy offloads eligible database workloads to zIIP processors.

Functions that support this keyword

- Image Copy function
- Recovery function
- Create Image Copy function

Statements that support this keyword

GLOBAL statement

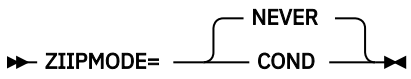
Site default option

Supported

Related keyword

None.

Format



COND

Offloads some workloads to zIIP processors. COND is effective only when available zIIP processors are found. Otherwise, the job is run on the main CPs.

NEVER

Does not offload any workload to zIIP processors. NEVER is the default to avoid unexpected performance degradation.

Default value

ZIIPMODE=NEVER

HPSRETCD control statement

The HPSRETCD data set contains user-specified control statements that define the return codes of IMS HP Image Copy processes.

HPSRETCD is an optional input data set. If you specify the name of the HPSRETCD data set for the RETCDDSN keyword of the GLOBAL statement, IMS HP Image Copy allocates HPSRETCD DD dynamically and uses it. For more information about the RETCDDSN keyword, see “RETCDDSN keyword” on page 228.

> **Note:** If you specify HPSRETCD control statements for FASTIC=(,COPY) processing, the specification of the return code is ignored.

Subtopics:

- “Format” on page 270
- “Control statement syntax” on page 270
- “(HPIC) Statement” on page 271

Format

This control data set usually resides in the input stream. However, it can also be defined as a sequential data set or as a member of a partitioned data set. It must contain 80-byte, fixed-length records. BLKSIZE, if coded, must be a multiple of 80. This data set must contain (HPIC) statements.

The following figure shows an example of the control statement in the HPSRETCD data set:

```
//HPSRETCD  DD  *
   (HPIC)
   T2ERROR=12,DBERROR=16,
   IOERROR=24,EMPTYIDX=28
```

> **Note:** On the control statement, you can code uppercase alphabetic characters, numeric characters, and the following special characters:
> Asterisk (*)
> Comma (,)
> Equal sign (=)
> Parenthesis ( )

Control statement syntax

The following describes the coding conventions that you must follow in writing control statements in the HPSRETCD data set:

- An (HPIC) control statement must be coded in the first line of the HPSRETCD data set, and optional parameters must be coded in the second or later lines.
- The (HPIC) control statement and option parameters must be coded within column 1 and column 72.
- When more than one option parameter is coded, they must be separated by commas. No blanks are allowed between the option parameters and the commas, or within the option parameters.
- Option parameters can be continued onto one or more following control statement records.
- Option parameters are not positional parameters; they can be specified in any order of sequence. A null value is not allowed for any option parameter.
- Comments can follow the last option parameter on each control statement record separated by at least one blank.
- A comment line must begin with an asterisk in column 1.
- The only control statement name that can be used within round brackets is HPIC, as in *(HPIC)*.

(HPIC) Statement

The (HPIC) statement specifies the options for return codes. There must be only one (HPIC) statement, and it must be the first statement in the HPSRETCD data set.

If multiple conditions for nonzero return code occur, IMS HP Image Copy returns the highest return code.

The (HPIC) statement supports the following optional keywords:

- CATLGERROR=*nn*|0
- COMPWARN=*nn*|0
- DBERROR=*nn*|4
- DEDBPCER=*nn*|2
- EMPTYIDX=*nn*|8
- ICDSNOTF=*nn*|8
- INDEXCIC=*nn*|0
- IOERROR=*nn*|8
- PCLOADER=*nn*|4
- SPMNERROR=*nn*|8
- SPMNWARN=*nn*|4
- STACMDFAIL=*nn*|4
- T2ERROR=*nn*|2
- TMSERROR=*nn*|8

CATLGERROR

If IMS HP Image Copy detects a failure in the CATALOG macro for the stack data set, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 0.

> **Note:** This parameter is effective only for the Image Copy function.
> If you specify a value higher than 8 for this parameter:
> - IMS HP Image Copy will not register the IC record that has been detected as a catalog failure to RECON.
> - IMS HP Image Copy will not process the remaining DBDSs, which are not yet processed.

COMPWARN

If a warning of compression routine is detected, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 0.

DBERROR

Specify the return code that is to be issued when a database error is detected. *nn* is 0 - 99. The default value is 4. This option is effective when HASH Check of HD Pointer Checker is requested.

DEDBPCER

If IMS HP Image Copy detects a DEDB Pointer Checker error return, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 2.

EMPTYIDX

If IMS HP Image Copy finds empty index databases when processing an Image Copy function, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 0.

ICDSNOTF

If IMS HP Image Copy cannot find a valid input image copy data set in processing Recovery function and Create Image Copy function, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 8.

INDEXCIC

If IMS HP Image Copy attempts to process concurrent image copy of index databases, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 0.

IOERROR

If an I/O error is detected in either the primary or the secondary image copy process, and IMS HP Image Copy can continue that process, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 8.

PCLOADER

If IMS HP Image Copy fails in loading the IMS HP Pointer Checker module, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 4.

SPMNWARN

If space monitor detects a warning of return code 4, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 4. This option is effective when HASH Check of HD Pointer Checker is requested.

SPMNERROR

If space monitor detects a warning of return code 8, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 8. This option is effective when HASH Check of HD Pointer Checker is requested.

STACMDFAIL

If IMS HP Image Copy detects a failure in starting or releasing the quiesce state of the database, partition, or area for which the /START command or the UPDATE DB STOP(QUIESCE) command was issued by IMS Tools Online System Interface, IMS HP Image Copy returns the return code that is specified by this parameter. *nn* is 0 - 99. The default value is 4.

T2ERROR

Specify the return code that is to be issued when a T2 (unknown data) error is detected. *nn* is 0 - 99. The default value is 2. This option is effective when HASH Check of HD Pointer Checker is requested.

TMSERROR

When processing the Recovery function and the Create Image Copy function, if time stamp of input image copy data set is different from that of the DBRC record, IMS HP Image Copy returns the return code specified by this parameter. *nn* is 0 - 99. The default value is 8. This option is effective when HASH Check of HD Pointer Checker is requested.

FABJDRSN control statement

The FABJDRSN data set contains the user-specified control statements that define the error reason codes and SMS reason codes of dynamic allocation.

The FABJDRSN data set specifies the error reason code (S99ERROR) and SMS reason code (S99ERSN) of the dynamic allocation. IMS HP Image Copy retries dynamic allocation, when the specified return code and reason code are returned for dynamic allocation of a tape unit.

If you specify the data set name for the DRSNDSN keyword, which is a keyword for the GLOBAL statement, IMS HP Image Copy allocates FABJDRSN DD dynamically and uses it. For more information about the DRSNDSN keyword, see “DRSNDSN keyword” on page 181.

Subtopics:

- “Format” on page 272
- “Control statement syntax” on page 273

Format

This control data set usually resides in the input stream. However, it can also be defined as a sequential data set or as a member of a partitioned data set. It must contain 80-byte, fixed-length records. BLKSIZE, if coded, must be a multiple of 80. This data set must contain statements.

The following is a sample control statement format in the FABJDRSN data set. The specification in this sample shows that the DYNALLOC reason codes (S99ERROR) are 4714 and 039C. Retry for DYNALLOC is specified for specific error reason codes of 9704, which are 012C, 012D, and 012F specified within parenthesis.

```
//FABJDRSN  DD  *
4714,                  4714: enough volume space was not found
039C,                  039C: Device and volume were incompatible
*
9704(012C,
     012D,
     012F)
```

Note: On the control statement, you can code 4-digit hexadecimal numbers and the following special characters:
Asterisk (*)
Comma (,)
Parenthesis ( )

Control statement syntax

The following list describes the coding conventions that you must follow in writing control statements in the FABJDRSN data set:

- The return code must be coded within column 1 and column 72.
- If you specify the reason code, specify return code and set associated reason code in parentheses.
- When there are more than one return code or reason code, they must be separated by commas. No blanks are allowed between the control statements and the commas, or within the control statements.
- Comments can follow the last option parameter on each control statement record separated by at least one blank.
- A comment line must begin with an asterisk in column 1.

ICEFICO control statement

ICEFICO is the optional input data set that contains the user-specified control statements that define the allocation attribute for the work data set used in the FASTIC=(,DUMP) process.

The FASTIC=(,DUMP) process uses a temporary data set as a work file during the DFSMSdss DUMP command process. IMS HP Image Copy dynamically allocates the data set. When either of the following conditions apply, the temporary data set cannot be used:

- The temporary data set is allocated as a virtual input/output (VIO) data set by system definition.
- The TEMPDSN class of RACF® is active.

If either condition applies, use the ICEFICO data set and provide allocation information for the temporary data set in it.

VIO data sets and tape units cannot be used as a temporary output work data set for DFSMSdss™. If you specify the ICEFICO DD statement, IMS HP Image Copy allocates a work data set for FASTIC=(,DUMP) by providing allocation information. This data set is then deleted when the process ends. If the ICEFICO data set is not provided, IMS HP Image Copy uses the OS temporary data set for work data set.

The allocated space for the data set is one cylinder.

If you specify the name of the ICEFICO data set name for the DSSTEMP keyword of the GLOBAL statement, IMS HP Image Copy allocates the ICEFICO DD dynamically and uses it. For more information about the DSSTEMP keyword, see “DSSTEMP keyword” on page 185.

Subtopics:

- “Format” on page 274
- “Control statement syntax” on page 274
- “Parameters” on page 274

Format

This control data set usually resides in the input stream. However, it can also be defined as a sequential data set or as a member of a partitioned data set. It must contain 80-byte, fixed-length records. BLKSIZE, if coded, must be a multiple of 80.

The following figure shows an example of the control statement in the ICEFICO data set:

```
//ICEFICO  DD *
  HLQ=ICSMS1.TESTDS,
  DATACLAS=DCICSTN,
  MGMTCLAS=MCICSTN,
  STORCLAS=SCICSTN
```

Note: On the control statement, you can code uppercase alphabetic characters, numeric characters, and the following special characters:
- Asterisk (*)
- Comma (,)
- Equal sign (=)
- Parenthesis ( )

Control statement syntax

The following describes the coding conventions that you must follow when writing control statements in the ICEFICO data set:

- The parameters must be coded within column 1 and column 72.
- When more than one option parameter is coded, they must be separated by commas. No blanks are allowed between the option parameters and the commas, or within the option parameters.
- Option parameters can be continued onto one or more following control statement records.
- Option parameters are not positional parameters; they can be specified in any order of sequence. A null value is not allowed for any option parameter.
- Comments can follow the last option parameter on each control statement record separated by at least one blank.
- A comment line must begin with an asterisk in column 1.

Parameters

Input parameters of ICEFICO are:

- DATACLAS
- HLQ
- MGMTCLAS
- STORCLAS
- VOLSER
- UNIT

DATACLAS

The DATACLAS keyword specifies the name of the data class for the SMS-managed work data set that is dynamically allocated.

HLQ

You can specify a high-level qualifier for the work data set. You can specify up to 22 bytes qualifier. IMS HP Image Copy allocates the data set by using the following naming rule: DSN=*hlq*.J*nnnnn*.D*yyddd*.T*hhmmss*

MGMTCLAS

The MGMTCLAS keyword specifies the name of the management class for the SMS-managed work data set that is dynamically allocated.

STORCLAS

The STORCLAS keyword specifies the name of the storage class for the SMS-managed work data set that is dynamically allocated.

VOLSER

The VOLSER keyword specifies the volume serial number.

UNIT

The UNIT keyword specifies the UNIT parameter of the work data set.

Allocating data sets dynamically

IMS HP Image Copy supports the dynamic allocation feature, which dynamically allocates data sets when you omit the corresponding DD statement for specific IMS HP Image Copy data sets.

For the Image Copy function, the following data sets can be allocated dynamically:

- Database data set
- DEDB area data set
- Output image copy data set
- RECON data set

For the Recovery function, the following data sets can be allocated dynamically:

- Database data set
- DEDB area data set
- Input data sets (including image copy, log, and change accumulation data sets)
- RECON data set

For the Create Image Copy function, the following data sets can be allocated dynamically:

- Input image copy data set
- Output image copy data set
- RECON data set

Topics:

- "Database data sets" on page 275
- "Output image copy data sets" on page 276
- "Input data sets for the Recovery function" on page 282
- "Input data sets for the Create Image Copy function" on page 283
- "Data set naming template" on page 283
- "Relation between input and output specifications" on page 288
- "RECON data sets" on page 288

Database data sets

The Image Copy function and the Recovery function support dynamic allocation of database data sets.

If the DBDALLOC=Y parameter is specified (either explicitly or by default) and database data sets are not provided by DD statements in the JCL, IMS HP Image Copy dynamically allocates the database data sets.

Subtopics:

- "DL/I database data sets" on page 276
- "HALDB database data sets" on page 276
- "DEDB area data sets" on page 276

DL/I database data sets

IMS HP Image Copy allocates DL/I database data sets by using DFSMDA members of the DL/I database. DL/I database data sets are allocated, if DFSMDA members of the DL/I database data sets exist in the libraries that the IMSDALIB DD or the STEPLIB DD statement specifies. The Image Copy function and the Recovery function determine the disposition of the DL/I databases based on the disposition of the DFSMDA members.

DBRC=Y is not required for dynamic allocation of the DL/I database.

HALDB database data sets

IMS HP Image Copy allocates HALDB database data sets by using DBDS record entries of DBRC. DBRC=Y must be specified to dynamically allocate HALDB database data sets.

IMS HP Image Copy applies the following values for disposition:

- Image Copy function: DISP=SHR
- Recovery function: DISP=OLD

DEDB area data sets

If DBDALLOC=Y and DBRC=Y parameters are specified (either explicitly or by default), the area data sets of the DEDBs are dynamically allocated by using the ADS list information that is registered to DBRC. IMS HP Image Copy determines the disposition of the data set with the DBRC information.

> **Note:** IMS HP Image Copy does not use DFSMDA members for dynamic allocation of DEDB area data sets.

IMS HP Image Copy applies the following values for disposition:

- Image Copy function: DISP=SHR
- Recovery function: DISP=OLD

Output image copy data sets

The Image Copy function and the Create Image Copy function support dynamic allocation of output image copy data sets.

If the ICDALLOC=Y parameter is specified (either explicitly or by default), the output image copy data sets can be dynamically allocated by IMS HP Image Copy.

The output type can be selected with the ICOUT and the STACK keywords. Either the ICOUT or the STACK keyword is required for dynamic allocation.

Attention: Oldest GDG data set might be deleted

IMS HP Image Copy does not support the DELETE subparameter of the z/OS® DISP parameter. The DELETE subparameter of the z/OS® DISP parameter is one of the abnormal termination (conditional) disposition subparameters that deletes data sets when a job or process ends abnormally. Therefore, once the output image copy data sets are dynamically allocated in an IMS HP Image Copy job, the allocated output image copy data sets remain regardless whether the job ends successfully or ends abnormally without successfully creating image copies. If the output image copy data sets are allocated as generation data sets (GDS) of generation data group (GDG) and if the maximum allowable number of active generation data sets is reached by the latest output image copy data set that IMS HP Image Copy dynamically allocated—regardless whether the data set is a successful image copy data set or incomplete image copy data set—the oldest generation data set in the GDG is uncataloged and deleted.

Using the ICOUT keyword

If the ICOUT keyword is specified, the output image copy data sets are created as non-stacked data sets.

The value for the ICOUT keyword can be *ddn* or an asterisk (*).

Subtopics:

- “ICOUT=ddn” on page 277

- “ICOUT=*” on page 277
- “Naming convention” on page 277

ICOUT=*ddn*

If you specify the ICOUT keyword with a specific ddname as, for example:

```
IC DBD=HDAMDB,DDN=HDAMDD,ICOUT=IC01
```

IMS HP Image Copy dynamically allocates the output image copy data set if the ICDALLOC=Y parameter is specified (either explicitly or by default) and the corresponding DD statement is not specified in the JCL.

IMS HP Image Copy internally constructs the name of the output image copy data set. See “Naming convention” on page 277 for the naming convention of output image copy data sets.

The allocation attribute keywords such as VOLUME, DATACLAS, and UNIT used for dynamic allocation are retrieved from the specified parameters or hardcoded defaults. IMS HP Image Copy tries to allocate the output data set dynamically with the data set displacement of OLD. If the data set is not found, IMS HP Image Copy dynamically allocates the data set with a displacement of NEW. You can control whether to catalog the data set name by name or not, by using the ICCAT keyword.

ICOUT=*

If you specify as an asterisk (*) for the ICOUT keyword, for example:

```
IC DBD=HDAMDB,DDN=HDAMDD,ICOUT=*
```

IMS HP Image Copy dynamically allocates the output image copy data set if the ICDALLOC=Y parameter is specified (either explicitly or by default).

IMS HP Image Copy internally constructs the ddname and the data set name for dynamic allocation. See “Naming convention” on page 277 for the naming convention of output image copy data sets.

Other specifications are the same as when a specific ddname is used.

Naming convention

When IMS HP Image Copy dynamically allocates an output image copy data set, it determines the name of the output data set based on the naming template or the value of the ICNMRULE keyword.

- If the data set naming template is defined and no ICNMRULE keyword is supplied, the data set name is generated based on the naming template.
- If both the data set naming template is defined and an ICNMRULE keyword is supplied, the data set name is generated based on the naming template.
- If neither the data set naming template nor the ICNMRULE keyword is supplied, ICNMRULE=N is applied and the data set name is generated following the ICNMRULE=N naming convention.
- If only the ICNMRULE keyword is supplied, the data set name is generated following the ICNMRULE naming convention.

Data set names generated from the ICNMRULE keyword naming convention:

If ICNMRULE=Y:

```
ichlq.ICn.dbdname.ddnameDyyddd.Thhmmss
```

If ICNMRULE=N:

```
ichlq.ICn.dbdname.ddname
```

where:

ichlq

The value specified for the ICHLQ keyword.

n

1 or 2, indicating primary or secondary copy.

dbdname

The DBD name or partition DBD name of the database to be copied.

ddname

The DD name of the target data set group or area to be copied.

yyddd

Date.

hhmmss

Time stamp.

First, IMS HP Image Copy tries to dynamically allocate the output data set with a data set displacement of OLD. If the data set is not found, IMS HP Image Copy dynamically then allocates the output data set with a displacement of NEW. You can control whether to catalog the data set name by name or not, by using the ICCAT keyword.

Using the STACK keyword (stacking image copy data sets)

If the STACK keyword is specified, output image copy data sets are created as stacked data sets.

When stacking is requested with the STACK keyword, the IMS HP Image Copy function groups the output image copy data sets with the ddname specified for the STACK keyword. The grouped output image copy data sets are written into the same tape volume or set of tape volumes identified with the stacked data set.

Output stacked image copy data sets are always allocated dynamically, even when ICDALLOC=N parameter is specified.

IMS HP Image Copy uses a stacked data set to identify each stack. It writes the stacked data set at the beginning of the tape volume or volumes, and the stacked image copy data sets follow one by one as separate data sets on the tape volume or volumes. Every output stacked image copy data set is dynamically allocated.

When the stack data set is requested, IMS HP Image Copy dynamically allocates a dummy data set first. The dummy data set is not allocated for the real data set, but it is used for controlling the stacking of the data sets internally. If you control the data set name by using the tape control program, you need to take the dummy data set into consideration.

If a data set naming template is not defined, the name of the output image copy data set is determined as follows:

```
ichlq.ICn.dbdname.ddname
```

where:

ichlq

The value specified for the ICHLQ keyword.

n

1 or 2, indicating primary or secondary copy.

dbdname

The DBD name or partition DBD name of the database to be copied.

ddname

The DD name of the target data set group or area to be copied.

yyddd

Date.

hhmmss

Time stamp.

Subtopics:

- “STACK=ddname” on page 279
- “STACK=*” on page 280

- “OFFLDSTACK=ddname|*” on page 280
- “Naming convention” on page 280

STACK=*ddname*

The stacked data set is identified by the ddname specified by the STACK=*ddname* keyword. If you provide a corresponding DD statement for the *ddname* specified for the STACK keyword, IMS HP Image Copy uses that DD for the stacked data set. If the corresponding DD is not found, IMS HP Image Copy dynamically allocates the stacked data set.

If you specify the STACK keyword with a specific ddname as, for example:

```
IC DBD=HDAMDB1,DDN=HDAMDD1,STACK=STACK1
IC DBD=HDAMDB2,DDN=HDAMDD2,STACK=STACK2
IC DBD=HDAMDB3,DDN=HDAMDD3,STACK=STACK1
```

IMS HP Image Copy stacks image copy data sets into the corresponding *DD name* data set of STACK=*ddname*.

IMS HP Image Copy dynamically allocates the output image copy data set. You can supply the data set allocation attribute by supplying option parameters in the ICEIN control statement or the DD card associated the *DD name*.

If the DD statement for the stacked data set is present in JCL, the Image Copy function no longer uses the allocation information for output image copy data sets that is specified by the ICEIN control statements. The Image Copy function uses the volume information of the stacked data set when allocating subsequent stacked image copy data sets.

The following DD statement must be provided when you use DD allocation for a stacked data set:

```
//ICEIN DD *
IC DBD=...,DDN=...,STACK=STACK1
IC DBD=...,DDN=...,STACK=STACK1
/*
//STACK1 DD UNIT=TAPE,DSN=anyname,
//          DISP=(NEW,KEEP),VOL=(,,,99),
//          LABEL=RETPD=60
```

You must supply all pertinent information by coding the appropriate JCL parameters on the DD statement, such as LABEL, UNIT, and VOL. The DSN parameter in a DD card is used as a dummy file for controlling a stack. The data set is allocated once, but it is not used for a real data set. The real data set must be named by the IMS HP Image Copy naming convention.

The files are stacked in the image copy data set as follows:

- ICEIN control statement
- DBDSs registered in the CA and DBDS groups
- DBDSs registered in the DBD

For example, if you specify the following ICEIN control statements:

```
//ICEIN DD *
GROUP CAGRP=PAYROLL,FUNC=IC,STACK=STACK1
IC    DBD=HDAM00,STACK=STACK1
IC    DBD=HDAM01,DDN=HDAM01D1,STACK=STACK1
/*
```

and assuming that:

- CA group PAYROLL contains three DBDSs: DBDSA, DBDSB, and DBDSC
- HDAM00 contains two DBDSs: HDAM00D1 and HDAM00D2
- HDAM01 contains one DBDS: HDAM01D1

The file sequence numbers assigned to the stacked data sets are as follows:

```
  Stacked data set
  CA GROUP=PAYROLL,DBDS=DBDSA        FILE=1
  CA GROUP=PAYROLL,DBDS=DBDSB        FILE=2
```

```
     CA GROUP=PAYROLL,DBDS=DBDSC        FILE=3
     DBD=HDAM00,DBDS=HDAM00D1           FILE=4
     DBD=HDAM00,DBDS=HDAM00D2           FILE=5
     DBD=HDAM01,DBDS=HDAM01D1           FILE=6
```

STACK=*

The IMS HP Image Copy dynamically allocates output image copy data sets regardless of the ICDALLOC parameter. If you specify STACK=*, IMS HP Image Copy allocates output data sets for the specified number of tasks.

For example:

```
GLOBAL TASKCTL=3,STACK=*
AIC DBD=DBD1,DDN=DBDS1
AIC DBD=DBD2,DDN=DBDS2
AIC DBD=DBD3,DDN=DBDS3
AIC DBD=DBD4,DDN=DBDS4
AIC DBD=DBD5,DDN=DBDS5
```

In this example, IMS HP Image Copy processes five DBDSs with three tasks (TASKCTL=3) in an IMS HP Image Copy job. IMS HP Image Copy allocates one output tape unit for each task, to which processes DBDS1, DBDS2, and DBDS3 are written. The output image copy data sets for each DBDS are stored in different tape units. When the image copy process for DBDS2 ends, IMS HP Image Copy starts processing DBDS4 and stacks its output to the same tape as DBDS2.

Another example:

```
GROUP FUNC=AIC,CAGRP=CAGRP1,STACK=*,GRPLIM=2
```

When five data sets are registered to CAGRP1, the Image Copy function dynamically allocates two outputs (GRPLIM=2) for output image copy and stacks five data sets to these DDs. In this case two tape units are required when two tasks are scheduled.

STACK=* helps to reduce run time and is easy to control STACK in your JCL.

If you use STACK=* in a parallel process, control the number of tasks with the GRPLIM keyword for the GROUP statement or the TASKCTL keyword. Otherwise, all processes for DBDSs will run in parallel and each output data set will be stored in different tape units and volumes.

> **Note:** STACK=* in an nonparallel process (IC/CIC) causes all image copy data sets of the processed DBDS in a job to be stored on one tape.

OFFLDSTACK=*ddname*|*

When creating Fast Recovery image copies by using the FASTIC=(,COPY) keyword, the primary image copy data set must be created on DASD, and you cannot specify the STACK keyword. Instead, you can use the OFFLDSTACK keyword to create secondary image copy data sets as stacked image copy data sets. In this case, you also need to specify the ICOUT=(,%STACK) and OFFLDTYPE=S keywords.

To control the output stack data sets in the same manner as using STACK=*ddname*, specify OFFLDSTACK=*ddname*.

To have IMS HP Image Copy assign the output stack data sets as in the same manner as using STACK=*, specify OFFLDSTACK=*.

Naming convention

When stacking is used, the Image Copy function always dynamically allocates stacked image copy data sets. The Image Copy function uses the allocation information inherited from the stacked data set. The data set name for each stacked image copy data set is constructed as follows:

```
ichlq.ICn.dbdname.ddname.Dyyddd.Thhmmss
```

where:

ichlq

The value specified for the ICHLQ keyword.

n

1 or 2, indicating primary or secondary copy.

dbdname

The DBD name or the partition DBD name of the database to be copied.

ddname

The DD name specified in the STACK keyword.

yyddd

Date.

hhmmss

Time stamp.

> **Note:** You can change the data set naming convention by using the data set naming template.

When the stacked data set is requested, IMS HP Image Copy dynamically allocates a dummy data set first. The dummy data set is not a real data set, but its allocation information is used internally for control. If you control the data set name by using the tape control program, you need to take the dummy data set into consideration. The name of the dummy data set is determined as follows:

- If STACKBASE=REAL is applied, the actual data set name of the output image copy that is generated with the naming convention is used.
- If STACKBASE=TEMP is applied, the name of the dummy data set is as follows:

  ```
  DSN=ichlq.ddname.job-no.Thhmmss
  ```

  where:

  ichlq

  The data set name prefix specified for the ICHLQ keyword.

  ddname

  The ddname specified for the STACK keyword.

  job-no

  The job number of the IMS HP Image Copy execution job.

  hhmmss

  Time stamp.

When stacking is used, the Image Copy function dynamically allocates a stacked data set by using the allocation information specified by the ICEIN control statements.

The following keywords are effective for each stacked image copy data set only when they are specified in the GLOBAL statement. If they are specified in any statement other than the GLOBAL statement, they are ignored.

UNIT keyword

```
UNIT=icunit
```

where *icunit* is the unit name.

VOL keyword

```
VOL=(,,,volcnt,SER=(ser1,ser2,...))
```

where:

volcnt

The volume count.

ser1, ser2 ...

The volume serial numbers.

EXPDT keyword

EXPDT2 keyword

```
EXPDT=expdt or RETPD=retpd
EXPDT2=expdt or RETPD2=retpd
```

where:

expdt

The expiration date.

retpd

The retention period.

DATACLAS keyword

DATACLAS2 keyword

```
DATACLAS=data_class_name
DATACLAS2=data_class_name
```

where *data_class_name* is the name of the data class.

MGMTCLAS keyword

MGMTCLAS2 keyword

```
MGMTCLAS=management_class_name
MGMTCLAS2=management_class_name
```

where *management_class_name* is the name of the management class.

STORCLAS keyword

STORCLAS2 keyword

```
STORCLAS=storage_class_name
STORCLAS2=storage_class_name
```

where *storage_class_name* is the name of the storage class.

The Image Copy function uses the volume information of the dynamically allocated stacked data set when allocating subsequent stacked image copy data sets.

> **Note:** The disposition parameter for each stacked image copy data set is `DISP=(NEW,KEEP)`.

Input data sets for the Recovery function

The Recovery function supports dynamic allocation of input image copy data sets.

If the DSDALLOC=Y parameter is specified (either explicitly or by default), the Recovery function dynamically allocates the input data set by using the information in the RECON data set. If you want input image copy data sets allocated dynamically, run the Recovery function job with DBRC=Y.

Input log data sets and change accumulation data sets

If the DSDALLOC=Y parameter is specified (either explicitly or by default), the Recovery function dynamically allocates appropriate log data sets and change accumulation data sets by using the information in the RECON data set.

Catalog information can also be used for dynamically allocating input image copy data sets, log data set, and change accumulation data sets. For more information, see the following keywords:

- "CAUNIT keyword" on page 165
- "ICUNIT keyword" on page 209
- "IGNORCAT keyword" on page 211
- "LOGUNIT keyword" on page 215

Input data sets for the Create Image Copy function

The Create Image Copy function supports dynamic allocation of input image copy data sets.

If the DSDALLOC=Y parameter is specified (either explicitly or by default), the Create Image Copy function allocates the input data set by using the information in the RECON data set. If you want input image copy data sets allocated dynamically, run the Create Image Copy job with DBRC=Y.

Data set naming template

A data set naming template provides flexibility for naming output image copy data sets that IMS HP Image Copy allocates dynamically.

Data set naming template supports generation data groups (GDG).

Subtopics:

- "Considerations for using the data set naming template" on page 283
- "Specifications of the data set naming template" on page 283
- "Specification syntax" on page 283
- "Symbolic parameters" on page 284
- "Examples" on page 286

Considerations for using the data set naming template

The following considerations apply when using the data set naming template:

- A naming template is available for the Image Copy function and the Create Image Copy function.
- A naming template can be specified only in the GLOBAL statement.
- DSN3-DSN7 can be used only for the Create Image Copy function.
- The templates for DSN, DSN2, DSN3, DSN4, DSN5, DSN6, and DSN7 must each be unique. The same naming pattern cannot be used for any two of these templates.
- When you use the naming template in making two or more image copies, one template is required for each copy.
- A naming template must be used when dynamically allocating GDG data sets.
- When a template is specified, the default naming rule and the ICNMRULE keyword are ignored.

Specifications of the data set naming template

The data set naming template is enabled by specifying the DSN keyword in the ICEIN GLOBAL statement. The data set naming convention that is applied depends on which naming template you specify. The specification of a naming template is a combination of naming patterns provided.

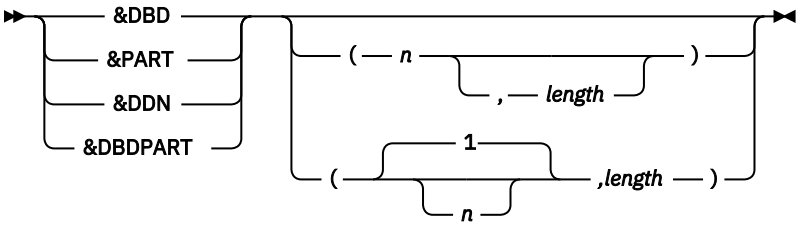
Specification syntax

The naming template conventions you must follow apply to:

- DSN
- DSN2
- DSN3
- DSN4
- DSN5
- DSN6
- DSN7
- SHDWDSN

The naming template conventions are as follows:

- Every symbolic variable must end with a period (.). If your data set name is `ICHLQ.DBD.DDN`, you specify `DSN=&ICHLQ..&DBD..&DDN`.
- The first period of the two periods between &ICHLQ and &DBD is part of the first parameter &ICHLQ; the second period separates the second parameter from the first.
- If you specify `&ICHLQ.&DBD.` (without the second period), the names of &ICHLQ. and &DBD will be merged. The result is ICHLQDBD.
- The rule for specifying the naming template is the same as that for the JCL symbolic parameter. Subparameters are provided for the &DBD, &PART, &DBDPART, and &DDN parameters:



  These symbolic parameters with subparameters return the substring of name string that begins at the *n*th character and is of *length* in length.

  The meanings of the name strings are as follows:

  - The DBD name for &DBD
  - The PART name for &PART
  - The DD/AREA name for &DDN
  - The DBD name of non-HALDB or PART name of HALDB for &DBDPART

  For *n* and *length*, you can specify the following values:

  - For &DBD or &DDN, *n* and *length* are integer values in the range of 1 - 8, respectively.
  - For &PART, *n* and *length* are integer values in the range of 1 - 7, respectively.
  - For &DBDPART, *length* is an integer value in the range of 1 - 8.

  If you omit *n*, it means 1. If you omit *length*, the rest of the name string is returned. You cannot omit both *n* and *length* at the same time.

Symbolic parameters

Symbolic parameters of IMS HP Image Copy are listed in the following table.

Table 98: Symbolic parameters

Symbol	Meaning
&ICHLQ	The data set prefix specified by the ICHLQ operand in the GLOBAL statement
&ICHLQ2	The data set prefix specified by the ICHLQ2 operand in the GLOBAL statement
&ICHLQ3	The data set prefix specified by the ICHLQ3 operand in the GLOBAL statement

Symbol	Meaning
&ICHLQ4	The data set prefix specified by the ICHLQ4 operand in the GLOBAL statement
&ICHLQ5	The data set prefix specified by the ICHLQ5 operand in the GLOBAL statement
&ICHLQ6	The data set prefix specified by the ICHLQ6 operand in the GLOBAL statement
&ICHLQ7	The data set prefix specified by the ICHLQ7 operand in the GLOBAL statement
&DBD &DBD(*n*,*length*)	DBD name. When the organization of the database is HALDB, &DBD symbol is interpreted as the master DBD name. If you want to extract a part of a string in the DBD name, use the &DBD() parameter.
&GROUP	DBRC group name. This symbol is used if the database data sets to process are identified from the GROUP statement or when the Image Copy function is called from IMS Database Recovery Facility jobs. This symbol is not applicable to database data sets that are not identified by the GROUP statement. • If the GROUP statement is specified, this symbol is interpreted as the DBRC group name. • If the Image Copy function is called from an IMS Database Recovery Facility job, this symbol is interpreted as the DBRC CA group name. If this symbol is used in other conditions, it is ignored.
&PART &PART(*n*,*length*)	The partition name of the HALDB. If you want to extract a part of a string in the partition name of the HALDB, use the &PART() parameter. If the database is not a HALDB and if &PART is specified, strings are not expanded and the qualifier is omitted.
&DBDPART &DBDPART(*n*,*length*)	When the database is a non-HALDB, the DBD name of the database is used. When the database is a HALDB, partition name of the HALDB is used. If you want to extract a part of a string in the DBD name or the partition name of a HALDB, use the &DBDPART() parameter.
&DDN &DDN(*n*,*length*)	DB data set ddname When the organization of the database is HALDB, the &DDN symbol is interpreted as the DD name of the partition database data set. When the organization of the database is DEDB, the &DDN symbol is interpreted as the AREA name of the DEDB database. If you want to extract a part of a string in the DD name or the AREA name, use the &DDN() parameter.
&IC	The string 'IC' or 'CRC'
&DATE	The Julian date (*yyyyddd*)
&SDATE	The Julian date, in short format (*yyddd*)
&YEAR	The year (*yyyy*)
&SYEAR	Two digits of the year (*yy*)
&MONTH	The month (*mm*)
&DAY	The day of the month (*dd*)
&JDAY	The day of the year (*ddd*)
&JDAY2	Lower two digits of the date in the day of the year (*dd*)
&TIME	The time stamp (*hhmmss*)
&HOUR	The hour (*hh*)
&MINUTE	The minute (*mm*)

Symbol	Meaning
&SECOND	The second (*ss*)
&GDG	The identifier of the GDG data set. IMS HP Image Copy processes the output data set name as GDG. (See notes.)

Notes:

1. This pattern is an identifier for the GDG data set.
2. &GDG must be specified in the last position in the pattern.
3. &GDG cannot be specified with a symbol related to date or time.
4. *n* is the position of the first character that is to appear in the result, *length* is the length of the result.

Examples

Refer to the following examples to learn how to use the naming template.

Example 1

Names of the image copy data sets that IMS HP Image Copy is expected to produce:

```
IC1: AAA.BBB.IC1.dbdname.ddname.GggggVvv
IC2: AAA.BBB.IC2.dbdname.ddname.GggggVvv
```

The naming templates available are:

```
GLOBAL
ICHLQ=AAA.BBB.IC1,
ICHLQ2=AAA.BBB.IC2,
DSN=&ICHLQ..&DBD..&DDN..&GDG.,
DSN2=&ICHLQ2..&DBD..&DDN..&GDG.
```

or

```
GLOBAL
ICHLQ=AAA.BBB,
DSN=&ICHLQ..&IC.1.&DBD..&DDN..&GDG.,
DSN2=&ICHLQ..&IC.2.&DBD..&DDN..&GDG.
```

Example 2

Names of the image copy data sets that IMS HP Image Copy is expected to produce:

```
IC1: AAA.BBB.COPY1.ddname.GggggVvv
IC2: AAA.BBB.COPY2.ddname.GggggVvv
```

The naming templates available are:

```
GLOBAL
ICHLQ=AAA.BBB.COPY1,
ICHLQ2=AAA.BBB.COPY2,
DSN=&ICHLQ..&DDN..&GDG.,
DSN2=&ICHLQ2..&DDN..&GDG.
```

or

```
GLOBAL
ICHLQ=AAA.BBB,
DSN=&ICHLQ..COPY1.&DBD..&DDN..&GDG.,
DSN2=&ICHLQ..COPY2.&DBD..&DDN..&GDG.
```

Example 3

Names of the image copy data sets that IMS HP Image Copy is expected to produce:

```
IC1: ICPRI.dbdname.ddname.GggggVvv
IC2: ICSEC.dbdname.ddname.GggggVvv
```

The naming template available is:

```
GLOBAL
ICHLQ=IC,
DSN=&ICHLQ.PRI.&DBD..&DDN..&GDG.,
DSN2=&ICHLQ.SEC.&DBD..&DDN..&GDG.
```

Example 4

Names of the image copy data sets that IMS HP Image Copy is expected to produce:

```
IC1: AAA.dbdname.ddname.GggggVvv
IC2: BBB.dbdname.ddname.GggggVvv
```

The naming template available is:

```
GLOBAL
DSN=AAA.&DBD..&DDN..&GDG.,
DSN2=BBB.&DBD..&DDN..&GDG.
```

Example 5

Names of the image copy data sets that IMS HP Image Copy is expected to produce:

```
IC1: AAA.dbdname.ddname.Dyyyyddd.Thhmmss
IC2: BBB.dbdname.ddname.Dyyyyddd.Thhmmss
```

The naming templates available are:

```
GLOBAL
DSN=AAA.&DBD..&DDN..D&DATE..T&TIME.,
DSN2=BBB.&DBD..&DDN..D&DATE..T&TIME.
```

or

```
GLOBAL
ICHLQ=AAA, ICHLQ2=BBB
DSN=&ICHLQ..&DBD..&DDN..D&DATE..T&TIME.,
DSN2=&ICHLQ2..&DBD..&DDN..D&DATE..T&TIME.
```

Example 6

Names of the image copy data sets that IMS HP Image Copy is expected to produce:

```
IC1 of non-HALDB: AAA.dbdname.ddname.ICDS
IC1 of HALDB: AAA.partname.ddname.ICDS
```

The naming template available is:

```
GLOBAL
DSN=AAA.&DBDPART..&DDN..ICDS
```

Example 7

Names of the image copy data sets that IMS HP Image Copy is expected to produce:

```
IC1 of non-HALDB: AAA.dbdname.ddname.ICDS
IC1 of HALDB: AAA.masterdbdname.partname.ddname.ICDS
```

The naming template available is:

```
GLOBAL
DSN=AAA.&DBD..&PART..&DDN..ICDS
```

Relation between input and output specifications

If you specify an ICEIN keyword for multiple input database data set groups, you are required to specify the corresponding ICEIN keyword for multiple output image copy data sets.

Subtopics:

- "Taking an image copy of a single database data set group" on page 288
- "Taking image copies of multiple database data set groups" on page 288
- "Taking an image copy of a CA group or a DBDS group" on page 288

Taking an image copy of a single database data set group

Specifying both the DBD keyword and the DDN keyword explicitly in an IC/AIC or CIC/ACIC control statement implies that you are requesting IMS HP Image Copy to take an image copy of a single input database data set group using a control statement, whose corresponding output keyword can be one of the following:

ICOUT=*ddname* or (*ddname1*,*ddname2*)
ICOUT=* or (*,*)
STACK=*ddname* or (*ddname1*,*ddname2*)
STACK=* or (*,*)

Taking image copies of multiple database data set groups

Specifying a DBD keyword only and omitting the DDN keyword in an IC/AIC or CIC/ACIC control statement implies that you are potentially requesting IMS HP Image Copy to take image copies of multiple input database data set groups using a control statement. In this case, you must not specify the ICOUT statement with a specific ddname:

ICOUT=*ddname* or (*ddname1*,*ddname2*)
Specify one of the following keyword parameters:

ICOUT=* or (*,*)
STACK=*ddname* or (*ddname1*,*ddname2*)
STACK=* or (*,*)

Taking an image copy of a CA group or a DBDS group

Specifying a GROUP control statement generally implies that you are requesting IMS HP Image Copy to take image copies of multiple database data set groups using a control statement. In this case, you must not specify the ICOUT statement with a specific ddname:

ICOUT=*ddname* or (*ddname1*,*ddname2*)
Specify one of the following keyword parameters:

ICOUT=* or (*,*)
STACK=*ddname* or (*ddname1*,*ddname2*)
STACK=* or (*,*)

RECON data sets

The Image Copy function, the Recovery function, and the Create Image Copy function support dynamic allocation of RECON data sets if RECON data sets are specified in the DFSMDA members.

Advanced Image Copy Services

Advanced Image Copy Services of IMS HP Image Copy allows you to take advantages of point-in-time copy functions (Concurrent Copy, FlashCopy®, and SnapShot) of DFSMSdss Advanced Copy Services to produce image copies faster and reduce unavailability time for IMS databases. IMS HP Image Copy uses the DFSMSdss cross-memory application programming interface (API) to access DFSMSdss Advanced Copy Services.

Advanced Image Copy Services provides the ability to create a Fast Recovery image copy, which recovers a database data set quickly, thus reducing total recovery time and the time that the database is unavailable.

You can activate Advanced Image Copy Services in IMS HP Image Copy function jobs that are executed with the FABJMAIN program. It is not supported for IMS HP Image Copy jobs executed with IMS compatible JCL. Advanced Image Copy Services is supported for both the batch image copy process and the concurrent image copy (CIC) process.

Benefits of activating Advanced Image Copy Services include:

- Reducing the time that the database data set is unavailable
- Reducing the time required to generate image copies
- Reducing the time required to recover a database data set

Many online databases must be available at all times. If a backup is made while the data is being updated, the backup could be unusable or could require that a log be applied to the restored version to synchronize the data. The alternative is to synchronize all parts of the database and stop all update activity during the backup.

DFSMSdss Advanced Copy Services is comprised of hardware and software services that allow you to back up a database or any collection of data at a point-in-time and with minimum downtime for the database. The database is unavailable only long enough for DFSMSdss™ to initialize a Concurrent Copy session for the data, which is a very small fraction of the time that the complete backup will take. The copy that is made does not include any update activity. After initialization, DFSMSdss™ releases all the serialization it holds on the data, informs the user that the initialization is complete so that update activity can resume, and begins reading the data. The following topics provide a brief description of each DFSMSdss Advanced Copy Services feature implemented within IMS HP Image Copy using the DFSMSdss API.

For more information about DFSMSdss Advanced Copy Services, see the following information:

- *z/OS® DFSMSdss™ Storage Administration Guide*
- *z/OS® DFSMS™ Advanced Copy Services*

When IMS database data sets reside on EMC DASD, IMS HP Image Copy can use the EMC API to invoke TimeFinder/Clone to copy the data sets instead of using FlashCopy® or SnapShot of DFSMSdss. For more information about EMC TimeFinder/Clone, see the EMC TimeFinder documentation.

Topics:

- “Copy methods” on page 289
- “Using Advanced Image Copy Services with the Image Copy function” on page 291
- “Using Advanced Image Copy Services with the Recovery function” on page 294
- “Considerations for using Advanced Image Copy Services” on page 294

Copy methods

Advanced Image Copy Services uses the DFSMSdss cross-memory API, ADRXMAIA, to process DFSMSdss DUMP and COPY commands. These commands allow IMS HP Image Copy to use the following DFSMSdss Advanced Copy Services: Concurrent Copy, FlashCopy®, and SnapShot Copy.

If IMS database data sets reside on EMC DASD, you can request IMS HP Image Copy to use the EMC TimeFinder/Clone API instead of DFSMSdss API.

Subtopics:

- “FlashCopy” on page 289
- “SnapShot Copy” on page 290
- “Concurrent Copy” on page 290
- “EMC TimeFinder/Clone” on page 290

FlashCopy®

FlashCopy® enables you to make copies of data sets, with the copies immediately available for read or write access. Subsequent updates to the original data sets are not reflected in the output data sets.

FlashCopy® creates a copy of a source volume on the target volume. This copy is called a point-in-time copy. Access to the point-in-time copy of the data on the source volume is through reading the data from the target volume. The actual point-in-time data that is read from the target volume might or might not be physically

stored on the target volume. As soon as a FlashCopy® relationship is established, the point-in-time data is available for reading from the target volume. However, if data is written to a data set that is a target data set in a FlashCopy® relationship and the updated target data set is read afterward, the data that is returned is user-updated data, and not the point-in-time source data set data. Target data sets are withdrawn from a FlashCopy® relationship as soon as any application writes to these data sets. FlashCopy® supports both System z®-attached (CKD) devices and Open System (FB) devices.

IMS HP Image Copy can use FlashCopy® only for DASD that supports FlashCopy® Version 2. With FlashCopy® Version 2, restrictions on source and target volumes being in the same logical subsystem have been lifted. The target data sets can be on the same volume as the source or any other volume within the same ESS subsystem. Also, multiple source copies can be made to different target locations.

For more information about FlashCopy®, see the following topics in *z/OS® DFSMS™ Advanced Copy Services* :

- "FlashCopy®"
- "Overview of FlashCopy®"

SnapShot Copy

SnapShot Copy is a feature on the RAMAC Virtual Array (RVA) device. Similar support exists for OEM devices. SnapShot Copy provides fast data replication using a combination of hardware and software services. SnapShot Copy functions only when the source and target locations reside within the same RVA subsystem. SnapShot Copy runs only when both the source data set and target data set reside on SnapShot Copy capable devices within the same storage subsystem.

Concurrent Copy

Concurrent copy of DFSMSdss is a storage subsystem extended function that provides point-in-time data consistency. The system serializes access to the data just long enough for the concurrent copy session to initialize. This serialization takes a matter of seconds. The copy is logically complete as soon as you have initialized the concurrent copy environment. At that point, concurrent copy protects the original state of the data. After logical completion, the serialization of the data set is released and the data is made available.

When DFSMSdss Concurrent Copy is used in creating image copies, the image copy process occurs in two phases: logical copy processing phase and then physical copy processing phase.

Logical copy processing

Serialization is obtained on the data sets and logical copy processing starts. This phase takes a small amount of time in relation to the total time required to create the image copy. Once the logical copy is complete, serialization of the data sets is released and the databases become available for updates. Logical copy processing is performed for both batch image copy (IC/AIC) and concurrent image copy (CIC/ACIC) processing.

- Any changes made to the data sets after the logical copy completes are not reflected in the image copy.
- Even though the database data sets are serialized, database records are not committed to IMS. Therefore, the generated concurrent image copies are fuzzy image copies of the data sets.
- When creating batch image copies, the databases can be brought back online after logical copy completes.

Physical copy processing

After the logical copy processing is complete, the physical copy processing begins. During this time, the records from the source data set are processed and the actual (physical) image copy is created. The image copy is not available until the physical copy processing completes.

EMC TimeFinder/Clone

EMC TimeFinder is a data set replication product for creating and managing point-in-time copies of data. EMC TimeFinder/Clone enables you to make copies of a set of tracks, with the copies immediately available for read or write access.

If you specify DATA_MOVER=EMCSNAP, IMS HP Image Copy uses EMC TimeFinder/Clone instead of FlashCopy® or SnapShot of DFSMSdss. For more information about configuring EMC TimeFinder, see the product documentation for EMC TimeFinder.

Using Advanced Image Copy Services with the Image Copy function

Advanced Image Copy Services is initiated if the FASTIC keyword of the ICEIN control statement is present in IMS HP Image Copy JCL.

Before you begin

Ensure that all the input database data sets are cataloged.

Procedure

1. In FABJMAIN JCL, code the EXEC statement as follows:

```
// EXEC  PGM=FABJMAIN,REGION=nM,IMSPLEX=plex-name,DBRCGRP=dbrcgrp
```

   Where:

   IMSPLEX

   If you need to start IMSplex through the IMS HP Image Copy job, specify the IMSPLEX parameter.

   DBRCGRP

   If you use the DBRCGRP keyword of IMS, you must specify the DBRCGRP parameter.

2. Code DD statements to define the input and output data sets. For more information, see "DD statements for creating image copies" on page 83.

   > **Tip:** It is recommended that you specify the DSSPRINT DD statement. This DD statement specifies the output stream for printing DFSMSdss messages, which are useful when you troubleshoot DFSMSdss problems.

3. Code the ICEIN DD statement and control statement keywords. The following JCL example starts an image copy job that uses Advanced Image Copy Services.

```
//EXAMPLE1   JOB
//           EXEC PGM=FABJMAIN
//STEPLIB    DD DISP=SHR,DSN=HPS.HPSLMD0
//           DD DISP=SHR,DSN=IMS.SDFSRESL
//DFSRESLB   DD DISP=SHR,DSN=IMS.SDFSRESL
//IMS        DD DISP=SHR,DSN=IMS.DBDLIB
//IMSDALIB   DD DISP=SHR,DSN=IMS.EXAMPLE.MDALIB
//DFSPRINT   DD SYSOUT=*
//ICEPRINT   DD SYSOUT=*
//DSSPRINT   DD SYSOUT=*
//ICEIN      DD *
  GLOBAL   UNIT=TAPE,VOLCNT=99,ICHLQ=ICOUT.DBT,FASTIC=(PREF,DUMP)          1
  IC       DBD=HDAMDB01,DDN=HDAMDD01,ICOUT=*                               2
  IC       DBD=HDAMDB01,DDN=HDAMDD02,ICOUT=*                               2
```

   1 On the GLOBAL statement, code the FASTIC keyword to enable Advanced Image Copy Services. The FASTIC keyword is in effect for all image copies created in this job step.
   Supply two operands for the FASTIC keyword:

   - The first operand (FREQ, REQ, PREF) specifies whether to fail the job when DFSMSdss Advanced Copy Services cannot be used or continue the job by using standard I/O instead.
   - The second operand (COPY, FDUMP, DUMP) specifies the DFSMSdss Advanced Copy Services function to use. The format of the image copies is determined based on the second operand. For more information, see "Format of image copy data sets" on page 26.

   For FASTIC keyword operands, see the following topics:

   - "FASTIC=(FREQ,), FASTIC=(REQ,), and FASTIC=(PREF,) processing" on page 292
   - "FASTIC=(,DUMP) processing" on page 293
   - "FASTIC=(,COPY) processing" on page 293
   - "FASTIC=(,FDUMP) processing" on page 293

2 Code IC, AIC, CIC, or ACIC statements. Advanced Image Copy Services is supported for both the batch image copy process (IC/AIC) and the concurrent image copy process (CIC/ACIC).

Only one database data set can be specified on one image copy statement. To create image copies of multiple database data sets, code one image copy statement for each database data set.

4. Submit the job.

Result

During the job, the following DFSMSdss API messages are generated in the DFSPRINT data set. This example is when FASTIC=(REQ,COPY) is specified.

```
DFS391I    D A T A   B A S E   D A T A   S E T   I M A G E   C O P Y   U T I L I T Y


      S Y S I N   C O N T R O L   C A R D
D1 P1E      P1E1     P1E1IC1                  N
      E N D   O F   S Y S I N   C O N T R O L   C A R D
DFS391I    **COPY DATA BASE P1E      DDNAME P1E1
FABJ4237I LOGICAL COPY COMPLETE FOR DB/AREA P1E    DDN P1E1     DSN MDOOLEY.HPIC.P1E1
FABJ4239I PHYSICAL COPY BEGIN FOR DB/AREA P1E      DDN P1E1     DSN MDOOLEY.HPIC.P1E1
FABJ4233I PHYSICAL COPY COMPLETE FOR DB/AREA P1E   DDN P1E1     DSN MDOOLEY.HPIC.P1E1
FABJ4217I NOTIFY.IC SUCCESSFUL FOR DBD P1E      DDN P1E1
**** END OF MESSAGES FOR DB/AREA: P1E      DDNAME: P1E1     DSNAME: MDOOLEY.HPIC.P1E1

...


DFS339I    FUNCTION IM HAS COMPLETED NORMALLY RC=00
```

Figure 45: Messages produced in DFSPRINT data set

- Message FABJ4237I indicates that logical copy processing was successful.
- Message FABJ4239I indicates that physical copy processing has begun.
- Message FABJ4233I indicates that physical copy processing was successful.

When image copy processing for each database ends, database authorization is released. The following messages are written to the job log (using WTO).

```
FABJ4260I COPY PROCESSING COMPLETE FOR DB/AREA P1E    0000 OF 0003 DATASETS FAILED
+FABJ4262I END OF UNAUTHORIZATION PROCESS FOR DBD=P1E
FABJ4261I COPIED DB/AREA P1E      DDN P1E1     DSN MDOOLEY.HPIC.P1E1
FABJ4261I COPIED DB/AREA P1E      DDN P1E2     DSN MDOOLEY.HPIC.P1E2
FABJ4261I COPIED DB/AREA P1E      DDN P1E3     DSN MDOOLEY.HPIC.P1E3
FABJ4263I ALL DATABASES WERE RELEASED FROM HPIC PROCESS
```

Figure 46: Messages issued during FASTIC processing

Message FABJ4262I is issued at the time when:

- For the FASTIC COPY option, image copy data sets of the database data sets are created.
- For the FASTIC FDUMP option, shadow data sets are created.
- For the FASTIC DUMP option, logical copy completed.

FASTIC=(FREQ,), FASTIC=(REQ,), and FASTIC=(PREF,) processing

Advanced Image Copy Services is initiated if the FASTIC keyword of the ICEIN control statement is present in IMS HP Image Copy JCL. The first parameter of the FASTIC keyword indicates whether the use of the Advanced Image Copy Services functions is required or preferred.

FASTIC is beneficial when there is a small amount of time during which the database can be unavailable. If Advanced Image Copy Services are available, then logical copy is performed quickly, and the database data set is made available. If Advanced Image Copy Services are unavailable, then the image copy is not taken, thus preventing the data set from being locked for a longer period of time.

If you specify FASTIC=(FREQ,) where FREQ represents FlashCopy® required, the image copy process fails if both SnapShot Copy and FlashCopy® are unavailable.

If you specify FASTIC=(REQ,) where REQ represents required, the image copy process fails if none of the Advanced Image Copy Services (Concurrent Copy, SnapShot Copy, or FlashCopy®) are available.

If you specify FASTIC=(PREF,DUMP) where PREF represents preferred, any available Advanced Image Copy Services are used and logical copy processing takes place followed by physical copy processing. If none of the services are available, the image copy is still created by the DFSMSdss DUMP command, but logical copy processing fails and access to the data set is restricted until physical copy processing completes.

> **Note:** If logical copy processing of DFSMSdss fails, IMS HP Image Copy does not process with FASTIC=N. This is true even if you specify FASTIC=(PREF,DUMP).

FASTIC=(PREF,COPY) processing runs in the same way as FASTIC=(REQ,COPY) processing. If none of the Advanced Image Copy Services are available, then the image copy fails. FASTIC=(,COPY) processing requires one of the Advanced Image Copy Services to create image copies.

FASTIC=(,DUMP) processing

If the second parameter of the FASTIC keyword specifies DUMP, the output image copy is a batch image copy or a compressed image copy. The DFSMSdss™ DUMP command is used to create the image copy.

If Concurrent Copy is available, then logical copy processing is performed. Once logical copy processing is complete, serialization for the data set is released and access to the data set is resumed while the physical copy takes place. During the physical copy process, records are read by DFSMSdss™, reformatted into IMS HP Image Copy format and then rewritten to the output image copy. If DBRC is active, the image copy is registered as a BATCH or CIC type image copy.

The FASTIC=(,DUMP) process uses the temporary data set as a work file during DFSMSdss DUMP command processing. IMS HP Image Copy dynamically allocates the data set. When either of the following conditions applies, the temporary data set cannot be used:

- The temporary data set is allocated as a virtual input/output (VIO) data set by system definition.
- The TEMPDSN class of RACF® is active.

If either condition applies, use the ICEFICO data set and provide allocation information for the work data set in it. IMS HP Image Copy allocates the data set based on the allocation information, and deletes it before the Image Copy function ends.

FASTIC=(,COPY) processing

If the second parameter of the FASTIC keyword specifies COPY, IMS HP Image Copy uses the DFSMSdss COPY command through the DFSMSdss API and creates a Fast Recovery image copy on the DASD volume as the primary image copy data set.

This Fast Recovery image copy is a replication of the input database data set or the input area data set. If the DASD on which the image copy data set resides is a SnapShot Copy or FlashCopy® capable storage subsystem, SnapShot or FlashCopy® is used. Otherwise, Concurrent Copy is used. If none of these DFSMSdss services are supported on the DASD, the image copy process fails.

If DBRC is active, the image copy is registered as an SMSONLC image copy (for concurrent image copy) or as an SMSOFFLC image copy (for batch image copy).

Optionally, you can create secondary image copy data sets in Fast Recovery image copy format or standard image copy format. To create a secondary image copy data set, specify the OFFLDTYPE keyword to select the format of the secondary image copy data set. If you select the standard image copy format, you can specify a tape device as the output device and enable stacking of image copy data sets. If you specify VIC=Y and HDPC=Y, you must supply the information for shadow data sets for the index database data sets.

FASTIC=(,FDUMP) processing

If the second parameter of the FASTIC keyword specifies FDUMP, the output image copy data set is created by following method:

1. The temporary image copy data sets, also called as shadow image copy data sets, are created by SnapShot or FlashCopy®.

2. After all temporary image copy data sets are created, actual image copy data sets are created from the temporary data sets on a DASD volume or on a tape in the standard image copy format.
3. IMS HP Image Copy deletes the temporary image copy data sets.

The advantage of FASTIC=(,FDUMP) processing is that the time the input database is locked is shorter compared to other processing types. In FASTIC=(,FDUMP) processing, IMS HP Image Copy releases the database when temporary image copy data sets are created.

The disadvantage of FASTIC=(,FDUMP) processing is that it requires DASD space for temporary image copy data sets in addition to the space required for output image copy data sets. The required space for the temporary image copy data sets is the same as the size of the input database data sets.

Using Advanced Image Copy Services with the Recovery function

Although the FASTIC keyword is not supported for the recovery (RCV) control statement, recovery detects the type of image copy and recovers the database data set using the appropriate technique.

If the image copy used for recovery was created using FASTIC=(,DUMP) processing, it will be in the same format as a batch image copy or a compressed image copy, and recovery will function as it does for a batch image copy or a compressed image copy. If the image copy used for recovery is a Fast Recovery image copy, IMS HP Image Copy uses the DFSMSdss™ API to restore the database and then forward recovery occurs, if needed.

Considerations for using Advanced Image Copy Services

The following considerations and restrictions apply when using Advanced Image Copy Services.

Subtopics:

- “Controlling the shadow data sets” on page 294
- “HASH Check in creating Fast Recovery image copy” on page 294
- “Required access method definition of KSDS” on page 295

Controlling the shadow data sets

If you specify ICEIN keywords in one of the following formats, IMS HP Image Copy creates shadow data sets internally:

- FASTIC=(*opt*,FDUMP)
- FASTIC=(*opt*,COPY), HDPC=Y, and VIC=Y or VIC=(Y,ONPC)

A shadow data set is a copy of the input database. The following considerations apply when creating shadow data sets:

- To create a shadow data set in a non-SMS-managed environment, you must specify the SHDWVOLSER keyword to specify the volume on which the shadow data set is created.
- Before you run an image copy job that creates shadow data sets, ensure that the system has enough DASD space to create shadow data sets. The shadow data sets require the same space as the space that is used by the input database. To create shadow data sets effectively, use the SHDW series keywords, which include SHDW_ERROR, SHDWDELETE, SHDWDSN, SHDWHLQ, SHDWMGMTCL, SHDWSTORCL, SHDWTCTL, and SHDWVOLSER.

HASH Check in creating Fast Recovery image copy

When creating a Fast Recovery image copy with FASTIC=(,COPY), you can enable the HASH Check option to verify the pointers. When the HASH Check option is enabled, the internal process flow of the Image Copy function is as follows:

1. Creates a Fast Recovery image copy.
2. Reads the data from the Fast Recovery image copy.
3. Runs the HASH Check process for the data.

The elapsed time for the image copy job increases as compared to a job that runs without HASH Check.

Required access method definition of KSDS

In using concurrent copy by specifying the FASTIC=(,DUMP) keyword, the concurrent image copy processing (CIC or ACIC processing) for VSAM KSDS requires that the data set is SMS-managed and the BWO(TYPEIMS) parameter is specified on the AMS DEFINE or ALTER statement for the data set. This ensures that IMS HP Image Copy can detect CI or CA splits that cause the output image copy to be unusable. However, this does not apply when VIC=Y is specified and the HASH Check is disabled. For details, see "VIC keyword" on page 263.

IMS HP Image Copy reports

The following topics describe reports and messages that are generated by IMS HP Image Copy.

Topics:

- "Report reference for FABJMAIN program" on page 295
- "ICEIN Statements report" on page 297
- "GLOBAL Options report" on page 297
- "Environment report" on page 299
- "Selected Area report" on page 299
- "HPSRETCD Statements report" on page 300
- "FABJDRSN Statements report" on page 300
- "ICEFICO Statements report" on page 301
- "Status message for Checkpoint Restart function" on page 301
- "Processing messages for the Image Copy function" on page 301
- "Processing messages for the Recovery function" on page 302
- "Image Copy Dump Process report" on page 302
- "Image Copy Process Summary report" on page 304
- "Image Copy Stacking Process report" on page 306
- "Create Image Copy report" on page 309
- "Recovery Process report" on page 312
- "DBRC NOTIFY.IC Processing report" on page 314
- "Data Set Statistics report" on page 314
- "DFSMSDSS Processing Messages report" on page 317
- "DFSMSDSS User Interaction Module (UIM) Statistics report" on page 318
- "Reports by HASH Check process" on page 319

Report reference for FABJMAIN program

IMS HP Image Copy jobs that are run by the FABJMAIN program generate various reports and messages.

The following table summarizes the reports and messages generated or issued by the functions of IMS HP Image Copy when the function is run by the FABJMAIN program.

Table 99: Reports and messages generated by IMS HP Image Copy functions (FABJMAIN)

Report	Output data set	Report function and content	Image Copy function	Recovery function	Create Image Copy function
ICEIN Statement report	ICEPRINT	The ICEIN Statements report contains the echo of the control statements you specified in the ICEIN data set.	Yes	Yes	Yes

Report	Output data set	Report function and content	Image Copy function	Recovery function	Create Image Copy function
GLOBAL Options report	ICEPRINT	The GLOBAL Options report shows the values set by the user (current values) as well as default values. It also shows which global options are in effect for the current job.	Yes	Yes	Yes
Environment report	ICEPRINT	The Environment report shows the environment information for the running process.	Yes	Yes	Yes
Selected Area report	ICEPRINT	The Selected Area report contains a list of DEDB areas that are selected for processing.	Yes	-	Yes
HPSRETCD Statement report	ICEPRINT	The HPSRETCD Statement report contains the echo of the control statements you specified in the HPSRETCD data set.	Yes	Yes	Yes
FABJDRSN Statement report	ICEPRINT	The FABJDRSN Statement report contains the echo of the control statements you specified in the FABJDRSN data set.	Yes	Yes	Yes
ICEFICO Statement report	ICEPRINT	The ICEFICO Statement report contains the echo of the control statements you specified in the ICEFICO data set.	Yes	-	-
Status messages for Checkpoint Restart	ICEPRINT	Status messages for the Checkpoint Restart function include processing information of the Checkpoint Restart function.	Yes	-	-
Processing messages for the Image Copy function	DFSPRINT or SYSPRINT	Processing messages for the Image Copy function include processing messages that were issued during the image copy process.	Yes	-	-
Processing messages for the Recovery function	DFSPRINT or SYSPRINT	Processing messages for the Recovery function include processing messages that were issued during the recovery process.	-	Yes	-
Image Copy Dump Process report	ICERPRT	The Image Copy Dump Process report contains the result of the Image Copy process and information about the IC record in DBRC.	Yes	-	-
Image Copy Process Summary report	FABJSMRY	The Image Copy Process Summary report contains information about the result of the image copy processing.	Yes	-	-
Image Copy Stacking Process report	FABJSTKR	The Image Copy Stacking Process report contains information about the result of the stacked image copy processing.	Yes	-	-
Create Image Copy report	ICERPRT	The Create Image Copy report contains the selected image copy information and output image copy of the Create Image Copy function.	-	-	Yes
Recovery Process report	ICERPRT	The Recovery Process report contains information about the selected image copy and output image copy for the Recovery function.	-	Yes	-
DBRC NOTIFY.IC Processing report	ICEDLST, SYSPRINT, ICEDLIST	The DBRC NOTIFY.IC Processing report contains information about DBRC NOTIFY.IC processing.	Yes	-	Yes
Data Set Statistics report	FABJSTAT	The Data Set Statistics report contains statistics information of the database data set that is processed by the Image Copy function.	Yes	-	-
DFSMSDSS Processing Messages report	DSSPRINT	The DFSMSDSS Processing Messages report contains processing messages issued by the DFSMSDSS data set services.	Yes	Yes	Yes
DFSMSDSS User Interaction Module (UIM) Statistics report	DSSSTATS	The DFSMSDSS User Interaction Module (UIM) Statistics report contains information about UIM processing.	Yes	Yes	Yes

ICEIN Statements report

The ICEIN Statements report contains the echo of the control statements you specified in the ICEIN data set.

The following figure is an example of the ICEIN Statements report.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "ICEIN STATEMENTS REPORT"                              PAGE:     1
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.28                    FABJMAIN - V4.R2

0........1.........2.........3.........4.........5.........6.........7.........8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

  GLOBAL   DBRC=Y,
           ICOUT=*,
           HDPC=Y,
           DEDBPC=Y,
           COMP=Y,
           ICHLQ=IMSTOOLS,
           DSN=&ICHLQ..&DDN..IC1,
           DSN2=&ICHLQ..&DDN..IC2,
           DSN3=&ICHLQ..&DDN..IC3,
           DSN4=&ICHLQ..&DDN..IC4,
           TASKCTL=3,
           UNIT=SYSDA,SPACE=(TRK,20,1,RLSE)
  GROUP    FUNC=AIC,DBDSGRP=DBDSGRP1
  GROUP    FUNC=AIC,CAGRP=CAGRP1
  AIC      DBD=PHDV0300,PART=PHDV03A
  AIC      DBD=PHDV0300,PART=PHDV03B
  IC       DBD=DEDBJN22
```

Figure 47: ICEIN statements report

GLOBAL Options report

The GLOBAL Options report shows the values set by the user (current values) as well as default values. It also shows which global options are in effect for the current job.

This report is written to the ICEPRINT DD data set. The body of the report contains three columns showing keywords, default values, and current values.

This report is always generated by FABJMAIN during IMS HP Image Copy initialization, and there is no option to turn off this report.

Some global options might be overridden by options specified on other statements. Therefore, the global options displayed in the report are not necessarily the options used by each image copy process.

The following figures show an example of the GLOBAL Options report.

```
IMS HIGH PERFORMANCE IMAGE COPY                         "ACTIVE GLOBAL OPTION REPORT"                           PAGE:     1
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.28                    FABJGLRP - V4.R2

KEYWORD        DEFAULT     ACTIVE GLOBAL SETTING FOR THIS STEP
-----------    --------    -----------------------------------
ADXCFGRP       *NO         *NO
BYPDBAUTH      NO          NO
CAUNIT
CIC_KSDS       YES         YES
COMP           NO          YES
COMPMODE       NO          NO
COMPRTN        FABJCMP1    FABJCMP1
CRCTYPE        P           P
DATA_MOVER     ADRDSSU     ADRDSSU
DATACLAS
DATACLAS2
DATACLAS3
DATACLAS4
DATACLAS5
DATACLAS6
DATACLAS7
DBALL          NO          NO
DBBUF          OPTIMIZED   OPTIMIZED
DBDALLOC       YES         YES
DBRC           YES         YES
DEDBPC         NO          YES
DEL_ICDS       NO          NO
DRSNDSN
DSBUF          50          50
DSDALLOC       YES         YES
DSN                        &ICHLQ..&DDN..IC1
DSN2                       &ICHLQ..&DDN..IC2
DSN3                       &ICHLQ..&DDN..IC3
DSN4                       &ICHLQ..&DDN..IC4
DSN5
DSN6
DSN7
DSNTYPE        BASIC       BASIC
DSSTEMP
EMPOSAM        0           0
EXPDT
EXPDT2
EXPDT3
EXPDT4
EXPDT5
EXPDT6
EXPDT7
EXTENT         52          52
FALLBACK       NO          NO
FASTIC         NO          NO
GDGBASE        NO          NO
GDGLIMIT       10          10
```

```
GROUPDIGITS    YES         YES
GRPLIM         15,5        15,5
GSGNAME
HDPC           NO          YES
HOMECHK        NO          NO
```

Figure 48: GLOBAL Options report (Part 1 of 3)

```
IMS HIGH PERFORMANCE IMAGE COPY                          "ACTIVE GLOBAL OPTION REPORT"                              PAGE:     2
5655-N45                                                DATE: 05/12/2020  TIME: 01.10.28                      FABJGLRP - V4.R2

KEYWORD        DEFAULT     ACTIVE GLOBAL SETTING FOR THIS STEP
-----------    --------    -----------------------------------
HPIO           YES         YES
ICBUF          50          50
ICCAT          YES         YES
ICDALLOC       YES         YES
ICHLQ                      RSQA.PCIC.IFPA.TSKZA.ICID
ICHLQ2
ICHLQ3
ICHLQ4
ICHLQ5
ICHLQ6
ICHLQ7
ICNMRULE       NO          NO
ICOUT          *           *
ICUNIT
IC_ERROR       CONT        CONT
IDXSRCH        NO          NO
IGNORCAT       NO          NO
ITKBLOAD       *NO         *NO
ITKBSRVR       *NO         *NO
IXKEYCHK       NO          NO
KEYLABEL
LBI            NO          NO
LOGUNIT
LOGUSE         YES         YES
MGMTCLAS
MGMTCLAS2
MGMTCLAS3
MGMTCLAS4
MGMTCLAS5
MGMTCLAS6
MGMTCLAS7
MSGFREQ        0           0
NOREUSE        NO          NO
NOTIFY         YES         YES
NOTIFYMODE     FORCE       FORCE
OFFLDSTACK     *           *
OFFLDTYPE      NO          NO
REGTIMESTMP    DIFFER      DIFFER
RESTART        YES         YES
               COUNT=5     COUNT=5
RETCDDSN
RETPD
RETPD2
RETPD3
RETPD4
RETPD5
RETPD6
RETPD7
RSTTYPE        1           1
RSTTYPE_STK    ALL         ALL
               NEW         NEW
SENSOR         NO          NO
```

Figure 49: GLOBAL Options report (Part 2 of 3)

```
IMS HIGH PERFORMANCE IMAGE COPY                          "ACTIVE GLOBAL OPTION REPORT"                              PAGE:     3
5655-N45                                                DATE: 05/12/2020  TIME: 01.10.28                      FABJGLRP - V4.R2

KEYWORD        DEFAULT     ACTIVE GLOBAL SETTING FOR THIS STEP
-----------    --------    -----------------------------------
SENSOR_HOME    NO          NO
SHDWDELETE     EACH        ALL
SHDWDSN                    &SHDWHLQ..&DDN.
SHDWHLQ                    RSQA.PCIC.IFPA.TSKZA.SHDW
SHDWMGMTCL
SHDWSTORCL
SHDWTCTL       15          15
SHDWVOLSER
SHDW_ERROR     CONT        CONT
SPACE                      TRK,    20,     1
SPMN           NO          NO
STACK
STACKBASE      TEMP        TEMP
STORCLAS
STORCLAS2
STORCLAS3
STORCLAS4
STORCLAS5
STORCLAS6
STORCLAS7
TASKCTL        15,5        15,5
THRESHOLDS
- LASTEXT      YES
- VOLEXT       YES
- EXTENTS      10
- FREESPC%     10
- AVAILEXT     10
- USEDSPC%     90
- CASPLIT%     50
- CISPLIT%     50
- REORGINTVL   NO
- DSSIZE%      90
- DSSIZE       NO
TIMECHK        YES         YES
TIMESTMP
TOIAUTO        NO          NO
               EVERY       EVERY
               DBR         DBR
               FIRST       FIRST
               LOCAL       LOCAL
```

```
              N/A         N/A
TOIAUTO_Q     NO          NO
TOIAUTO_STA   NO          NO
TOIRETRY      NO          NO
TOITIME       180,100     180,100
TOITIME_Q
TOIXCFGR
T2CHK         0,7         0,7
UNIT          TAPE        SYSDA   ,     0
UNIT2
UNIT3
UNIT4

IMS HIGH PERFORMANCE IMAGE COPY                          "ACTIVE GLOBAL OPTION REPORT"                          PAGE:     4
5655-N45                                                DATE: 05/12/2020  TIME: 01.10.28                     FABJGLRP - V4.R2

KEYWORD       DEFAULT     ACTIVE GLOBAL SETTING FOR THIS STEP
-----------   --------    -----------------------------------
UNIT5
UNIT6
UNIT7
USER          *NO         *NO
VIC           NO          NO
              ONPC
              ALL
VICDSN
VOLCNT
VOLSER
VOLSER2
VOLSER3
VOLSER4
VOLSER5
VOLSER6
VOLSER7
WAITALOC      NO          NO
WAITMSG       YES         YES
WAITTIME      30,CANCEL   30,CANCEL
ZIIPMODE      NEVER       NEVER
```

Figure 50: GLOBAL Options report (Part 3 of 3)

Environment report

The Environment report shows the environment information for the running process.

This report is generated in the ICEPRINT DD data set.

The following figure is an example of the Environment report.

```
IMS HIGH PERFORMANCE IMAGE COPY                               "ENVIRONMENT REPORT"                               PAGE:     1
5655-N45                                                DATE: 05/12/2020  TIME: 01.10.28                     FABJMAIN - V4.R2

  SYSTEM ENVIRONMENT
    OPERATING SYSTEM               : z/OS 02.04.00
    STORAGE MANAGEMENT             : DFSMS/zOS 02.04.00
    IMS                            : IMS 15.1
    RECON DATA SET                 : IMS V15R1    (MINIMUM VERSION = 13.1 )
```

Figure 51: Environment report

The report fields are as follows:

OPERATING SYSTEM

The name, version, and release information of the operating system.

STORAGE MANAGEMENT

The name, version, and release information of the storage management system.

IMS

The version and release information of IMS.

RECON DATA SET

The version and release information of the DBRC RECON data sets.

MINIMUM VERSION

The MINVERS information of the DBRC RECON data sets.

Selected Area report

The Selected Area report contains a list of DEDB areas that were selected for processing.

This report is generated in the ICEPRINT DD data set.

The following figure is an example of the Selected Area report.

```
IMS HIGH PERFORMANCE IMAGE COPY                              "SELECTED AREA REPORT"                                PAGE:     1
5655-N45                                                  DATE: 05/12/2020  TIME: 01.10.28                     FABJMAIN - V4.R2

  STATEMENT  DBD=      SPECIFIED AREA=               SELECTED AREA NAME
  ---------  --------  ----------------------------  ------------------------------------------------------------------------
  AIC        DEDBJN22  RANGE(0001,0002)              DB22AR0   DB22AR21

  NOTE : '#' INDICATES THAT THE AREA IS DUPLICATE AND THE IMAGE COPY FUNCTION IS NOT PROCESSED FOR THIS AREA.
```

Figure 52: Selected Area report

The Selected Area report shows the following information:

STATEMENT

Supplied ICEIN control statement. The values can be IC, AIC, CIC, ACIC, and CRC.

DBD=

The DBD name that the DBD keyword specifies.

SPECIFIED AREA=

The value that the AREA keyword specifies. If the AREA keyword is not specified, N/A is shown.

SELECTED AREA NAME

The names of the selected areas to be processed. A number sign (#) that is shown to the right side of the area name indicates that a duplicate area name is found and that the image copy function did not process the area.

Notes:

- Areas selected by the GROUP statement are not shown in this report.
- In the restart mode of the Checkpoint Restart function, field SELECTED AREA NAME also includes the names of the areas for which the process was not restarted. To identify the restarted areas, see “Image Copy Process Summary report” on page 304.

HPSRETCD Statements report

The HPSRETCD Statements report contains the echo of the control statements that you specified in the HPSRETCD data set.

This report is generated in the ICEPRINT DD data set only when the HPSRETCD DD is specified.
The following figure is an example of the HPSRETCD Statement report.

```
IMS HIGH PERFORMANCE IMAGE COPY                            "HPSRETCD STATEMENTS REPORT"                            PAGE:     1
5655-N45                                                  DATE: 05/12/2020  TIME: 01.10.28                     FABJRETC - V4.R2
0........1.........2.........3.........4.........5.........6.........7.........8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  (HPIC)
  DBERROR=16
```

Figure 53: HPSRETCD Statements report

FABJDRSN Statements report

The FABJDRSN Statements report contains the echo of the control statements you specified in the FABJDRSN data set.

This report is generated in the ICEPRINT DD data set only when the FABJDRSN DD is specified.
The following figure is an example of the FABJDRSN Statements report.

```
IMS HIGH PERFORMANCE IMAGE COPY                            "FABJDRSN STATEMENTS REPORT"                            PAGE:     1
5655-N45                                                  DATE: 05/12/2020  TIME: 01.10.28                     FABJDRSN - V4.R2
0........1.........2.........3.........4.........5.........6.........7.........8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
4714, 4714: ENOUGH VOLUME SPACE WAS NOT FOUND
039C, 039C: DEVICE AND VOLUME WERE INCOMPATIBLE
*
9704(012C,
012D,
012F)
```

Figure 54: FABJDRSN Statements report

ICEFICO Statements report

The ICEFICO Statements report contains the echo of the control statements you specified in the ICEFICO data set.

This report is generated in the ICEPRINT DD data set only when the ICEFICO DD is specified.
The following figure is an example of the ICEFICO Statement report.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "ICEFICO STATEMENTS REPORT"                          PAGE:      1
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.28                     FABJMAIN - V4.R2
0........1.........2.........3.........4.........5.........6.........7.........8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
HLQ=IMSTEMP.USERID.AID508K,UNIT=DASD,VOLSER=VOL001
```

Figure 55: ICEFICO Statements report

Status message for Checkpoint Restart function

Status messages for the Checkpoint Restart function include processing information of the Checkpoint Restart function.

These messages are printed in the ICEPRINT DD data set only when the Checkpoint Restart function is enabled.
The following figure is an example of the status messages for Checkpoint Restart function.

```
FABJ4133I CHECKPOINT RESTART OPTION(Y)
FABJ4135I THIS PROCESS IS RUNNING IN RESTART MODE.
FABJ4136I THIS IS THE  1ST PROCESS OF A RESTART.
FABJ4134I IMAGE COPY PROCESS WILL BE RESTARTED BECAUSE OF FAILURE IN THE PREVIOUS RUN.
FABJ4103I D1 PHDV0030 PHD003AA FABJ1001         YFABJCMP1Y
FABJ4134I IMAGE COPY PROCESS WILL BE RESTARTED BECAUSE OF FAILURE IN THE PREVIOUS RUN.
FABJ4103I D1 PHDV0030 PHD003AB FABJ1002         YFABJCMP1Y
FABJ4134I IMAGE COPY PROCESS WILL BE RESTARTED BECAUSE OF FAILURE IN THE PREVIOUS RUN.
FABJ4103I D1 PHDV0030 PHD003AC FABJ1003         YFABJCMP1Y
FABJ4131I IMAGE COPY PROCESS WAS ATTEMPTED, BUT IT DID  NOT COMPLETE SUCCESSFULLY. THIS DBDS WILL BE REPROCESSED IN THE NEXT RUN.
FABJ4103I D1 PHDV0030 PHD003AB FABJ1002         YFABJCMP1Y
FABJ4130I IMAGE COPY PROCESS WAS ATTEMPTED, BUT IT WAS NOT PROCESSED BECAUSE RELATED DBDS HAS FAILED TO CREATE AN IMAGE COPY.
FABJ4103I D1 PHDV0030 PHD003AC FABJ1003         YFABJCMP1Y
FABJ4104I IMAGE COPY PROCESS WILL NOT BE RESTARTED BECAUSE IT WAS COMPLETED SUCCESSFULLY IN THE PREVIOUS RUN
FABJ4103I D1 DEDBJN23 DB23AR0  FABJ1004         YFABJCMP1Y
FABJ4100I CHECKPOINT RESTART PROCESS COMPLETED, CHECKPOINT FILE IS IN RESTART MODE.
```

Figure 56: Status messages for Checkpoint Restart function

Processing messages for the Image Copy function

The processing messages for the Image Copy function include processing messages that are issued during the image copy process.

The following figure is an example of the processing messages for the Image Copy function. Messages for the following are written to the DFSPRINT or the SYSPRINT DD data set:

- SYSIN data image for the IMS Image Copy utility
- Compression rate
- Record count
- RECON update status
- Return code

```
DFS391I    D A T A   B A S E   D A T A   S E T   I M A G E   C O P Y   U T I L I T Y

      S Y S I N   C O N T R O L   C A R D
D1 PHDV0300 PHDV03AA FABJ1001         YFABJCMP1Y
      E N D   O F   S Y S I N   C O N T R O L   C A R D
FABJ9007I  COMPRESSED BY EXITNM = FABJCMP1 COMPRESSED COUNT = 00000000145 COMPRESS RATIO = 07.7 %
DFS2803I   RECORD COUNT = 000000147 FOR DDNAME PHDV03AA
           COPY 1 ON VOLUME(S) - R1I800
DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED

      S Y S I N   C O N T R O L   C A R D
D1 PHDV0300 PHDV03AB FABJ1002         YFABJCMP1Y
      E N D   O F   S Y S I N   C O N T R O L   C A R D
FABJ9007I  COMPRESSED BY EXITNM = FABJCMP1 COMPRESSED COUNT = 00000000031 COMPRESS RATIO = 09.5 %
DFS2803I   RECORD COUNT = 000000033 FOR DDNAME PHDV03AB
           COPY 1 ON VOLUME(S) - R1I800
DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED

      S Y S I N   C O N T R O L   C A R D
D1 PHDV0300 PHDV03BB FABJ1004         YFABJCMP1Y
```

```
      E N D   O F   S Y S I N   C O N T R O L   C A R D
FABJ9007I  COMPRESSED BY EXITNM = FABJCMP1 COMPRESSED COUNT = 00000000031 COMPRESS RATIO = 09.5 %
DFS2803I   RECORD COUNT = 000000033 FOR DDNAME PHDV03BB
           COPY 1 ON VOLUME(S) - R1I800
DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED

      S Y S I N   C O N T R O L   C A R D
D1 PHDV0300 PHDV03BA FABJ1003         YFABJCMP1Y
      E N D   O F   S Y S I N   C O N T R O L   C A R D
FABJ9007I  COMPRESSED BY EXITNM = FABJCMP1 COMPRESSED COUNT = 00000000145 COMPRESS RATIO = 07.7 %
DFS2803I   RECORD COUNT = 000000147 FOR DDNAME PHDV03BA
           COPY 1 ON VOLUME(S) - R1I800
DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED

D1 DEDBJN22 DB22AR0  FABJ1013         YFABJCMP1Y
      E N D   O F   S Y S I N   C O N T R O L   C A R D
DFS391I    **COPY DATA BASE DEDBJN22   AREA DB22AR0
FABJ9007I  COMPRESSED BY EXITNM = FABJCMP1 COMPRESSED COUNT = 00000000493 COMPRESS RATIO = 09.2 %
DFS2803I   RECORD COUNT = 000000495 FOR   AREA DB22AR0
           COPY 1 ON VOLUME(S) - R1I800
DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED

DFS339I    FUNCTION IM HAS COMPLETED NORMALLY RC=00
```

Figure 57: Processing messages for the Image Copy function

To check the meaning of each message, see “Messages” on page 397 and *IMS Messages and Codes*.

Processing messages for the Recovery function

The processing messages for the Recovery function include processing messages that are issued during the recovery process.

The following figure is an example of the processing messages for the Recovery function. Messages for the following are written to the DFSPRINT or the SYSPRINT DD data set:

- SYSIN data image for the IMS Recovery utility
- Input record count for the recovery process
- RECON update status
- Return code

```
DFS391I    D A T A   B A S E   D A T A   S E T   R E C O V E R Y   U T I L I T Y
      S Y S I N   C O N T R O L   C A R D S
DFS391I    S  DBHDAM30 HDAMDD30 DFSUDUMP
      E N D   O F   S Y S I N   C O N T R O L   C A R D S
DFS391I    **RECOVER DATA BASE DBHDAM30 DDNAME HDAMDD30
DFS323W    FUNCTION RV WAS NOT SUPPLIED A CHANGE ACCUMULATION INPUT
DFS324W    FUNCTION RV WAS NOT SUPPLIED AN INPUT LOG FILE
DFS2803I   RECORD COUNT = 000000101 FOR DDNAME DFSUDUMP
DFS2803I   RECORD COUNT = 000000000 FOR DDNAME DFSUCUM
DFS2803I   RECORD COUNT = 000000000 FOR DDNAME DFSULOG
DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED
DFS339I    FUNCTION RV HAS COMPLETED NORMALLY RC=00
```

Figure 58: Processing messages for the Recovery function

To check the meaning of each message, see “Messages” on page 397 and *IMS Messages and Codes*.

Image Copy Dump Process report

The Image Copy Dump Process report contains the result of the image copy process and information about the IC record in DBRC.

This report is generated in the ICERPRT DD data set.

The following figures show an example of the Image Copy Dump Process report.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "IMAGE COPY DUMP PROCESS "                          PAGE:     1
5655-N45                                              DATE: 05/12/2020  TIME: 01.10.28                   FABJDMP5 - V4.R2

DBDSGRP
  GRPNAME=DBGRP1            #MEMBER=0003   -DBD-    -DDN/AREA-
                                           DBHDAM30  HDAMDD30
                                           DBHDAM50  HDAMDD51
                                           DBHDAM50  HDAMDD52
```

Figure 59: Image Copy Dump Process report—group information

The group information shows the following information:

The row following the two header rows (before GRPNAME) shows the category name of the group in DBRC.

GRPNAME

The name of the group.

#MEMBER

The number of data sets in the group.

-DBD-

List of DBD names in the group.

-DDN/AREA-

List of DBDS ddnames and area names in the group.

```
IMS HIGH PERFORMANCE IMAGE COPY                              "IMAGE COPY DUMP PROCESS "                                PAGE:     1
5655-N45                                                   DATE: 05/12/2020  TIME: 01.10.28                          FABJDMP5 - V4.R2

  DBD=PHDV0300  PART=PHDV03A   DDN=PHDV03AA
   DD=FABJ1004     BATCH                       COMPRESSED COUNT = 00000000145  COMPRESS ROUTINE=FABJCMP1  COMPRESS RATIO = 07.7 %
    ICTIME=20201330011031073019-0400
    USID=0000000001  RUNTIME=20201330011031073019-0400  STOPTIME=00000000000000000000+0000
    DSN=RSQA.PCIC.IFPA.TSKZA.ICID.PHDV03AA.IC1         UNIT=3390      FILE SEQ=00001
    VOLSER=R1I800
    RECORD COUNT=147
```

Figure 60: Image Copy Dump Process report—image copy information

The image copy information shows the following information:

DBD

The name of the processed DBD.

PART

The name of the HALDB partition.

DDN | AREA

The ddname of the processed DBDS or the area name.

DBDSGRP | CAGRP | DBGRP | RECOVGRP

The group name of the DBDSGRP, DBGRP, RECOVGRP, or CAGRP that is processed. When the Image Copy function is not processed in groups, this value is not reported.

DD

The image copy ddname in the process.

BATCH | CONCUR | SMSNOCIC | SMSCIC | SMSOFFLC | SMSONLC

The type of image copy process.

COMPRESSION ROUTINE

The name of the compression routine that is processed.

ICTIME

The time stamp of the image copy start time. This value is not reported if IMS HP Image Copy is started by IMS Online Reorganization Facility.

USID

The update set identifier of the database or area when the reorganization occurred. This value is not reported if processed with DBRC=N or IMS HP Image Copy is started by IMS Online Reorganization Facility.

RUNTIME

The registered RUNTIME in the IC record of DBRC. This value is not reported if processed with DBRC=N or IMS HP Image Copy is started by IMS Online Reorganization Facility.

STOPTIME

The registered STOPTIME in the IC record of DBRC. This value is not reported if processed with DBRC=N or IMS HP Image Copy is started by IMS Online Reorganization Facility.

DSN

The data set name of the output image copy data set.

UNIT

The unit name of the image copy data set.

FILE SEQ

The number of file sequences in the image copy data set.

VOLSER

The volume serial name where the image copy data set resides.

RECORD COUNT

The count of record numbers in the image copy data set.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "IMAGE COPY DUMP PROCESS "                              PAGE:     2
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.28                    FABJDMP5 - V4.R2
  DBDS(S) TO BE RESTARTED     #MEMBER=0001          -DBD-    -DDN/AREA-
                                                   HDAMDB01  HDAMDS01
```

Figure 61: Image Copy Dump Process report—restart DB information

The restart DB information is generated only when both of the following conditions are met:

- Checkpoint Restart function is enabled
- The next run is set to the Restart mode.

The restart DB information shows the following information:

#MEMBER

The number of data sets that are to be reprocessed at the next restart process.

-DBD-

List of DBD names that are to be reprocessed.

-DDN/AREA-

List of DBDS ddnames and area names that are to be reprocessed.

Image Copy Process Summary report

The Image Copy Process Summary report contains information about the result of image copy processing.

This report consists of two sections.

- “Image Copy Process Summary section” on page 304
- “Image Copy Process by Database section” on page 305

Image Copy Process Summary section

The following figure is an example of the Image Copy Process Summary section.

```
IMS HIGH PERFORMANCE IMAGE COPY                       "IMAGE COPY PROCESS SUMMARY REPORT"                       PAGE:     1
5655-N45                                                DATE: 05/12/2020  TIME: 01.10.28                    FABJMAIN - V4.R2

CHECKPOINT RESTART PROCESS MODE: NONE

FINAL RETURN CODES (RC) OF IMAGE COPY STEP

IMAGE COPY  HDPC  DEDBPC
----------  ----  ------
        00    00      00
```

Figure 62: Image Copy Process Summary section

The report fields are as follows:

CHECKPOINT RESTART PROCESS MODE

The mode or the status of the Checkpoint Restart function. This field shows the mode, which can be either checkpoint mode or restart mode, or whether the function is disabled.

FINAL RETURN CODES (RC) OF IMAGE COPY STEP

The return codes of the Image Copy job step, the HASH Check process by HD Pointer Checker, and the HASH Check process by DEDB Pointer checker.

Image Copy Process by Database section

The following figure is an example of the Image Copy Process by Database section.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "IMAGE COPY PROCESS SUMMARY REPORT"                          PAGE:     2
5655-N45                                                   DATE: 05/12/2020  TIME: 01.10.28                       FABJMAIN - V4.R2

DB       PART     DD        IC   IC    HASH   COMP IC    ICDS STATUS
NAME     AREA     NAME      TYPE RC    STATUS RC   REG   1ST      2ND
-------- -------- --------  ---- ----  ------ ---- ----  -------- --------
DBHDAM30          HDAMDD30  IC     00  OK       00 REG   OK       -
DBHDAM50          HDAMDD51  IC     00  OK       00 REG   OK       -
DBHDAM50          HDAMDD52  IC     00  OK       00 REG   OK       -
DH41TS01          DH41TSDD  IC     00  OK       00 REG   OK       -
DH41TS01          DH42TSDD  IC     00  OK       00 REG   OK       -
DX41TS01          DX41TSDD  VIC    00  OK      N/A REG   N/A      N/A
DEDBJN22 DB22AR0            IC     00  OK       00 REG   OK       -
DEDBJN22 DB22AR1            IC     00  OK       00 REG   OK       -
DEDBJN22 DB22AR2            IC     00  OK       00 REG   OK       -
DEDBJN22 DB22AR3            IC     00  OK       00 REG   OK       -

NOTE:
--------
IC RC : INDICATES THE RETURN CODE BY THE IMAGE COPY PROCESS OF THE DATABASE DATA SET.
        "#" INDICATES THAT THE DATABASE DATA SET IS TO BE REPROCESSED BY CHECKPOINT RESTART FUNCTION.
        "!" INDICATES THAT THE DATABASE DATA SET IS NOT TO BE REPROCESSED BECAUSE OF THE SEVERE DB ERROR.
```

Figure 63: Image Copy Process by Database section

The report fields are as follows:

DB NAME

The name of the processed DBD.

PART AREA

The name of the processed partition name of HALDB or area name of DEDB.

DD NAME

The DD name of the processed database data set.

IC TYPE

The type of the image copy processing for the database.

IC

Batch image copy

CIC

Concurrent image copy

VIC

Virtual image copy for the index databases

IC RC

The return code of the image copy processing for the database. The sign at the right side of the return code shows additional information:

#

The database will be reprocessed by the Checkpoint Restart function.

!

The database will not be reprocessed because a severe error occurred.

HASH STATUS

The return code of the HASH pointer check processing for the database.

WARN

An unidentified error is detected.

SEVERE

A severe error is detected.

COMP RC

The return code of the compression processing for the database if COMP=Y is specified to compress the output image copy data set.

IC REG

The result of image copy registration processing that is done to the DBRC RECON for the database.

REG

Registered successfully.

BYP

Registration is bypassed because of errors.

N/A

IMS HP Image Copy did not register the image copy.

ICDS STATUS

The status of the primary image copy data set (1ST) and the secondary image copy data set (2ND).

OK

The data set was created successfully.

ERR

The image copy data set was created, but the data set has an error.

CAT ERR

The image copy data set was created, but the data set is not cataloged due to a cataloging error.

DEL

The created image copy data set was deleted due to an error in the data set or errors in other database data sets in the same database group.

DEL ERR

The created image copy data set has an error or errors exist in other database data sets in the same database group, but the attempt to delete the image copy data set failed.

N/A

The image copy data set is not created.

Image Copy Stacking Process report

The Image Copy Stacking Process report contains information about the result of stacked image copy processing.

This report consists of several sections.

- “Stacking Process Summary section” on page 306
- “STACK DD Summary section” on page 307
- “STACK DD Detail section” on page 308
- “Bypassed Databases section” on page 308

Stacking Process Summary section

The Stacking Process Summary section shows a list of STACK DD statements that are processed in the job step of IMS HP Image Copy. It also shows whether the tape volume on the STACK DD statement is to be replaced or not for the restart processing of the Checkpoint Restart function.

The following figure is an example of the Stacking Process Summary section.

```
IMS HIGH PERFORMANCE IMAGE COPY              "IMAGE COPY STACKING PROCESS REPORT"                                  PAGE:     1
5655-N45                                              DATE: 05/12/2020  TIME: 01.10.28                      FABJMAIN - V4.R2
*** STACK DD SUMMARY ***
    STACK     TO BE      PRIMARY/
    DD NAME   RESTARTED  SECONDARY  RELATED DD
    --------  ---------  ---------  --------------------------------------------------
  # STACKDD1  YES        PRIMARY    STK2, STACKDD3
  # STK2      NO         SECONDARY  STACKDD1
  # STACKDD3  YES        SECONDARY  STACKDD1
 NOTE:
 --------
 "#" INDICATES THAT THE DD CONTAINS IMAGE COPY DATA SET(S) WITCH HAVE ALREADY PROCESSED SUCCESSFULLY.
     PLEASE CHANGE TAPE VOLUME(S) WITH MARKED # PRIOR TO NEXT RESTART PROCESS. OTHERWISE, THE IMAGE COPY DATA SET(S) WILL BE
     OVERWRITTEN.
```

Figure 64: Stacking Process Summary section

The report fields are as follows:

STACK DD NAME

The DD name for the STACK keyword where the image copies are stacked.

TO BE RESTARTED

This field indicates whether the stack DD is reprocessed or not by the Checkpoint Restart function.

PRIMARY/SECONDARY

This field indicates whether the stacked image copy data set is registered as a primary image copy or a secondary image copy.

PRIMARY

The stack DD is used for the primary image copy.

SECONDARY

The stack DD is used for the secondary image copy.

N/A is shown for the Create Image Copy function.

RELATED DD

A list of DD statements that are related to the DD statement.

If the DD statement is used for the primary image copy, DD statements for its secondary image copies are shown. If the DD statement is used for the secondary image copy, DD statement for its primary DD statement is shown.

The following figure shows an example of the ICEIN statements that are used for the STACK DD Report Summary section of "Figure: Stacking Process Summary section" on page 306.
Figure 65: Sample ICEIN statements for stack processing

```
//ICEIN

  IC  DBD=DB1,DDN=DBDD1 STACK=(STACKDD1,STK2)
  IC  DBD=DB1,DDN=DBDD1 STACK=(STACKDD1,STACKDD3)
  IC  DBD=DB1,DDN=DBDD1 STACK=STACKDD1
  IC  DBD=DB1,DDN=DBDD1 STACK=(STACKDD1,STACKDD3)

/*
```

STACK DD Summary section

The STACK DD Summary section shows general information about the STACK DD. This section is provided for each of STACK DD statements processed.

The following figure is an example of the STACK DD Summary section.

```
IMS HIGH PERFORMANCE IMAGE COPY              "IMAGE COPY STACKING PROCESS REPORT"                                  PAGE:     1
5655-N45                                              DATE: 05/12/2020  TIME: 01.10.28                      FABJMAIN - V4.R2
     *************************
     *                       *
     *   DD NAME : STACKDD1  *
     *                       *
     *************************
     NOTE:  PLEASE CHANGE THE FOLLOWING TAPE VOLUME(S) PRIOR TO NEXT RESTART PROCESS.
            OTHERWISE, THE IMAGE COPY DATA SET(S) WILL BE OVERWRITTEN.
     VOLUME INFORMATION FOR THIS DD
     ------------------------------
       UNIT     = 3490
       VOLSER   = TAPE01
```

Figure 66: STACK DD Summary section

The report fields are as follows:

DD NAME

The DD name on the STACK keyword, where the image copies are stacked.

UNIT

The unit name that is used for stacked image copy processing.

VOLSER

The volume serial name that is used for stacked image copy processing.

STACK DD Detail section

The STACK DD Detail section shows detail information about the STACK DD. This section is provided for each of the STACK DD statements processed.

When an IMS HP Image Copy job is run several times by the Checkpoint Restart function, the tape specified on the STACK DD statement will contain several image copies of databases. However, this section of the report lists only the databases that are processed in one job step, which means the list of databases provided in this section does not include all the databases that are stacked in the tape. If you want to see a complete list of the databases, you must use DITTO or see information about databases that are registered to DBRC.

The following figure is an example of the STACK DD Detail section.

```
IMS HIGH PERFORMANCE IMAGE COPY              "IMAGE COPY STACKING PROCESS REPORT"                                  PAGE:     2
5655-N45                                          DATE: 05/12/2020  TIME: 01.10.28                        FABJMAIN - V4.R2
STACK DD = STACKDD1  (PAGE:     2)
******* STACKED IMAGE COPY DATA SET(S) *******
  DB       PART     DD                                                                 CATALOG   TO BE
  NAME     AREA     NAME      IMAGE COPY DATA SET NAME                    FILESEQ STATUS    RESTARTED
  -------- -------- --------  ------------------------------------------- ------- --------- ---------
  DBHDAM10          HDAMDD10  ICSMS1.UGTEST.DBHDAM10.HDAMDD10.IC1               1 CATALOGED
  PHDV0100 PHDV01A  PHDV01AA  ICSMS1.UGTEST.PHDV0100.PHDV01AA.IC1               2 CATALOGED
  DEDBJN23 DB23AR0            ICSMS1.UGTEST.DEDBJN23.DB23AR0.IC1               3 CATALOGED
  DBHDAM20          HDAMDD20  ICSMS1.UGTEST.DBHDAM20.HDAMDD20.IC1               4 CATALOGED
  HISAM000          HISAM000  ICSMS1.UGTEST.HISAM000.HISAM000.IC1               5 CATALOGED
  HISAM000          HISAM001  ICSMS1.UGTEST.HISAM000.HISAM001.IC1               6 CATALOGED
  DEDBJN23 DB23AR1            ICSMS1.UGTEST.DEDBJN23.DB23AR1.IC1               7 FAILED    YES
```

Figure 67: STACK DD Detail section

The report fields are as follows:

STACK DD

The DD name on the STACK keyword, where the image copies are stacked.

DB NAME

The name of the processed DBD.

PART AREA

The name of the processed partition name of HALDB or area name of DEDB.

DD NAME

The DD name of the processed database data set.

IMAGE COPY DATA SET NAME

The name of the image copy data set

FILESEQ

The file sequence number of the image copy data set in the tape volume of the STACK DD.

CATALOG STATUS

This field indicates whether the image copy data set is successfully cataloged or not.

TO BE RESTARTED

This field indicates whether the stack DD is reprocessed or not by the Checkpoint Restart function.

Bypassed Databases section

The Bypassed Databases section shows a list of the databases that were not processed in the job.

The following figure is an example of the Bypassed Database section.

```
IMS HIGH PERFORMANCE IMAGE COPY              "IMAGE COPY STACKING PROCESS REPORT"                                  PAGE:     3
5655-N45                                          DATE: 05/12/2020  TIME: 01.10.28                        FABJMAIN - V4.R2
STACK DD = STACKDD1  (PAGE:     3)
******* THE FOLLOWING DATABASE DATA SET(S) WERE TO BE PROCESSED BUT THE PROCESS WAS BYPASSED *******
  DB       PART     DD
  NAME     AREA     NAME
  -------- -------- --------
  DEDBJN23 DB23AR2
  DBHDAM30          HDAMDD30
  PHDV0100 PHDV01B  PHDV01BA
```

Figure 68: Bypassed Databases section

The report fields are as follows:

STACK DD

The DD name on the STACK keyword, where the image copies are stacked.

DB NAME

The name of the processed DBD.

PART AREA

The name of the processed partition name of HALDB or area name of DEDB.

DD NAME

The DD name of the processed database data set.

Create Image Copy report

The Create Image Copy report contains information about the selected image copy and the output image copies generated by the Create Image Copy function.

This report is generated in the ICERPRT DD data set.

The following figures show examples of the Create Image Copy report.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "CREATE IMAGE COPY REPORT"                          PAGE:     1
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.28                  FABJCRC0 - V4.R2

DBDSGRP
  GRPNAME=DBGRP1             #MEMBER=0003   -DBD-    -DDN/AREA-
                                            DBHDAM30  HDAMDD30
                                            DBHDAM50  HDAMDD51
                                            DBHDAM50  HDAMDD52
```

Figure 69: Create Image Copy report—group information

The group information shows the following information:

The row following the two header rows (before GRPNAME) shows the category name of the group in DBRC.

GRPNAME

The name of the group.

#MEMBER

The number of data sets in the group.

-DBD-

List of DBD names in the group.

-DDN/AREA-

List of DBDS ddnames and area names in the group.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "CREATE IMAGE COPY REPORT"                          PAGE:     2
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.36                  FABJCRC0 - V4.R2

  DBD=DBHDAM30  DDN=HDAMDD30                DBGRP=DBGRP1
   -IMAGE COPY INFORMATION REGISTERED IN DBRC
   DD=DFSUDUMP     BATCH                       SELECTED AS ORIGINAL IMAGE COPY
    USID=0000000001  RUNTIME=20201330110312854 60-0400  STOPTIME=00000000000000000000+0000
    DSN=RSQA.PCIC.IFPA.TSKZA.ICID.HDAMDD30.IC1         UNIT=3390      FILE SEQ=00001
    VOLSER=R1I800
    RECORD COUNT=101
   -IMAGE COPY INFORMATION OF A SELECTED ORIGINAL IMAGE COPY
   DD=DFSUDUMP     BATCH
    DBD=DBHDAM30  DDN=HDAMDD30                   COMPRESS ROUTINE=FABJCMP1
    DSN=RSQA.PCIC.IFPA.TSKZA.ICID.HDAMDD30.IC1         UNIT=3390      FILE SEQ=00001
    VOLSER=R1I800
```

Figure 70: Create Image Copy report—input image copy data set information

The input image copy data set information shows the following information:

DBD

The name of the processed DBD.

PART

The name of the HALDB partition.

DDN | AREA

The ddname of the processed DBDS or the area name.

DBDSGRP | CAGRP | DBGRP | RECOVGRP

The group name of the DBDSGRP, DBGRP, RECOVGRP, or CAGRP that is processed. When the Create Image Copy function is not processed in groups, this value is not reported.

-IMAGE COPY INFORMATION REGISTERED IN DBRC

Subheader of the input image copy information from DBRC.

DD

The image copy ddname in the process.

BATCH | CONCUR | ONLINE | SMSCIC | SMSNOCIC | SMSOFFLC | SMSONLC

The type of image copy process.

SELECTED AS ORIGINAL IMAGE COPY

The selected image copy data set as the input for CRC.

USID

The update set identifier of the database or area when the reorganization occurred.

RUNTIME

The registered RUNTIME in the IC record of DBRC.

STOPTIME

The registered STOPTIME in the IC record of DBRC.

DSN

The data set name of the output image copy data set.

UNIT

The unit name of the image copy data set.

FILE SEQ

The number of file sequences in the image copy data set.

VOLSER

The volume serial name where the image copy data set resides.

RECORD COUNT

The count of record numbers in the image copy data set.

-IMAGE COPY INFORMATION OF A SELECTED ORIGINAL IMAGE COPY

Subheader of the selected image copy data set as input data.

DD

The image copy ddname in the process.

BATCH | CONCUR | ONLINE | SMSNOCIC | SMSCIC | SMSOFFLC | SMSONLC

The kind of image copy process.

DBD

The name of the processed DBD.

DDN | AREA

The ddname of the processed DBDS or the area name.

COMPRESSION ROUTINE

The name of the compression routine that is processed.

DSN

The data set name of the selected image copy data set.

UNIT

The unit name of the image copy data set.

FILE SEQ

The number of file sequences in the image copy data set.

VOLSER

The volume serial name where the image copy data set resides.

```
IMS HIGH PERFORMANCE IMAGE COPY                              "CREATE IMAGE COPY REPORT"                                PAGE:     3
5655-N45                                                   DATE: 05/12/2020  TIME: 01.10.36                        FABJCRC0 - V4.R2

   -CREATED IMAGE COPY INFORMATION
   DD=FABJ1001                                                  LOGICAL COPIED  COMPRESS ROUTINE=FABJCMP4
    DSN=RSQA.PCIC.IFPA.TSKZA.ICCD.HDAMDD30.CRC1       UNIT=3390      FILE SEQ=00001
    VOLSER=R1I800
    RECORD COUNT=101
   -NOTIFIED IMAGE COPY RESULT
   DD=DFSUDUMP     BATCH
    USID=0000000001  RUNTIME=20201330110312854600-0400  STOPTIME=00000000000000000000+0000
    DSN=RSQA.PCIC.IFPA.TSKZA.ICID.HDAMDD30.IC1        UNIT=3390      FILE SEQ=00001
    VOLSER=R1I800
   DD=FABJ1001     BATCH
    USID=0000000001  RUNTIME=20201330110312854600-0400  STOPTIME=00000000000000000000+0000
    DSN=RSQA.PCIC.IFPA.TSKZA.ICCD.HDAMDD30.CRC1       UNIT=3390      FILE SEQ=00001
    VOLSER=R1I800
```

Figure 71: Create Image Copy report—output image copy data set information

The output image copy data set information shows the following information:

-CREATED IMAGE COPY INFORMATION

Subheader of the generated image copy data set.

DD

The image copy ddname in the process.

PHYSICAL COPIED | LOGICAL COPIED

The type of copy process.

COMPRESSION ROUTINE

The processed compression routine name when the logical copy process is used.

DSN

The data set name of the output image copy data set.

UNIT

The unit name of the image copy data set.

FILE SEQ

The number of file sequences in the image copy data set.

VOLSER

The volume serial name where the image copy data set resides.

RECORD COUNT

The count of record numbers in the image copy data set.

-NOTIFIED IMAGE COPY RESULT

Subheader of the DBRC information when NOTIFY.IC is processed.
The information is reported for both the primary and the secondary IC.

DD

The image copy ddname in the process.

BATCH | CONCUR | ONLINE | SMSNOCIC | SMSCIC | SMSOFFLC | SMSONLC

The type of image copy process.

USID

The update set identifier of the database or the area where the reorganization occurred.

RUNTIME

The registered RUNTIME in the IC record of DBRC.

STOPTIME

The registered STOPTIME in the IC record of DBRC.

DSN

The data set name of the image copy data set.

UNIT

The unit name of the image copy data set.

FILE SEQ

The number of file sequences in the image copy data set.

VOLSER

The volume serial name where the image copy data set resides.

Recovery Process report

The Recovery Process report, generated by the Recovery function, contains information about the selected image copy and recovered data sets.

This report is generated in the ICERPRT DD data set.

The following figure is an example of the Recovery Process report.

```
IMS HIGH PERFORMANCE IMAGE COPY                          "RECOVERY PROCESS REPORT"                                PAGE:     1
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.46                      FABJRDB5 - V4.R2

  DBD=DBHDAM30  DDN=HDAMDD30
   -RECOVERED DATABASE DATA SET INFORMATION
   DD=HDAMDD30
    DSN=RSQA.PCIC.IFPA.TSKZA.DBDS.HDAMDS30            UNIT=3390      FILE SEQ=00001
    DSID=00001
    DBORG=HDAM
    DSORG=OSAM
    CAGRP=CAGRHDAM
   -IMAGE COPY INFORMATION
   DD=DFSUDUMP     BATCH
    DBD=DBHDAM30  DDN=HDAMDD30                   COMPRESS ROUTINE=FABJCMP1
    USID=0000000001  RUNTIME=20201330111031285460-0400  STOPTIME=00000000000000000000+0000
    DSN=RSQA.PCIC.IFPA.TSKZA.ICID.HDAMDD30.IC1        UNIT=3390      FILE SEQ=00001
    VOLSER=R1I800
    RECORD COUNT=101
   -CHANGE ACCUMULATION INFORMATION
   DD=DFSUCUM
    DSN=HPICE2.IMSPRVL.ICE15.CAGRHDAM.CA204806        UNIT=3390      FILE SEQ=00001
    VOLSER=HPICE2
    RECORD COUNT=1
   -LOG(S) INFORMATION
   DD=DFSULOG
    DSN=HPICE2.IMSPRVL.ICE15.RLDS.V00.T2047177        UNIT=3390      FILE SEQ=00001
    VOLSER=HPICE2
    RECORD COUNT=4
```

Figure 72: Recovery Process report

This report contains the following information:

-RECOVERED DATABASE DATA SET INFORMATION

Subheader of the processed DBDS information.

DDN

The ddname of the input image copy data set.

DBD

The name of the processed DBD.

UNIT

The unit name of the processed DBDS.

FILE SEQ

The number of file sequences in the processed DBDS.

DSID

The data set ID number that appears as part of the information in the DBDLIB data set for the processed DBDS.

DBORG

The database organization that is defined for the processed DBDS in the DBDLIB data set.

DSORG

The data set organization that is defined for the processed DBDS in the DBDLIB data set.

DBDSGRP | CAGRP

The group name of the DBDSGRP or CAGRP where processed DBDS is defined.

-IMAGE COPY INFORMATION

Subheader of the input image copy information from DBRC.

DD

The DBDS ddname in the image copy data set.

BATCH | CIC | ONLINE | SMSCIC | SMSNONCIC

The type of image copy process.

DBD

The name of the processed DBD.

DDN

The ddname of the image copy data set.

USID

The update set identifier of the database or area when the reorganization occurred.

UNIT

The unit name of the image copy data set.

RUNTIME

The registered RUNTIME in the IC record of DBRC.

STOPTIME

The registered STOPTIME in the IC record of DBRC.

DSN

The data set name of the image copy data set.

UNIT

The unit name of the image copy data set.

FILE SEQ

The number of file sequences in the image copy data set.

VOLSER

The volume serial name where the image copy data set resides.

RECORD COUNT

The count of record numbers in the image copy data set.

-CHANGE ACCUMULATION INFORMATION

Subheader of the input change accumulation data set information from DBRC.

DDN

The ddname of the change accumulation data set.

DSN

The data set name of the change accumulation data set.

UNIT

The unit name of the change accumulation data set.

FILE SEQ

The number of file sequences in the change accumulation data set.

VOLSER

The volume serial name where the change accumulation data set resides.

RECORD COUNT

The count of applied record numbers from the change accumulation data set.

-LOG(S) INFORMATION

Subheader of the input Log data set information from DBRC.

DDN

The ddname of the Log data set.

DSN

The data set name of the Log data set.

UNIT

The unit name of the Log data set.

FILE SEQ

The number of file sequences in the Log data set.

VOLSER

The volume serial name where the Log data set resides.

RECORD COUNT

The count of applied record numbers from the Log data set.

DBRC NOTIFY.IC Processing report

The DBRC NOTIFY.IC Processing report contains information about DBRC NOTIFY.IC processing.

This report is generated in the ICEDLIST DD or the SYSPRINT DD data set.

This report is generated if the Database Recovery Control utility is called by:

- The Image Copy function during DBRC command processing.
- The Create Image Copy function during DBRC NOTIFY.IC processing.
- The Recovery function during GENJCL.RECOV command processing.

The following figure shows an example of the DBRC NOTIFY.IC Processing report.

```
         IMS VERSION 15 RELEASE 1 DATA BASE RECOVERY CONTROL          PAGE 0001
 CHANGE.IC -
   DBD(DBHDAM30) -
   DDN(HDAMDD30) -
   RECTIME(20133011031285460-0400) -
   ICDSN(RSQA.PCIC.IFPA.TSKZA.ICID.HDAMDD30.IC1) -
   VALID -
   FILESEQ(0001) -
   VOLLIST(R1I800) -
   UNIT(3390) -
   ICDSN2(RSQA.PCIC.IFPA.TSKZA.ICCD.HDAMDD30.CRC1) -
   VALID2 -
   FILESEQ2(0001) -
   VOLLIST2(R1I800) -
   UNIT2(3390) -
   RECDCT(0000000101)
DSP0103I  DATA SET NAME DOES NOT FOLLOW NAMING CONVENTIONS
DSP0103I  DSNAME=RSQA.PCIC.IFPA.TSKZA.ICID.HDAMDD30.IC1
DSP0103I  DATA SET NAME DOES NOT FOLLOW NAMING CONVENTIONS
DSP0103I  DSNAME=RSQA.PCIC.IFPA.TSKZA.ICCD.HDAMDD30.CRC1
DSP0203I  COMMAND COMPLETED WITH CONDITION CODE 00
DSP0220I  COMMAND COMPLETION TIME 20.133 01:10:37.981625
         IMS VERSION 15 RELEASE 1 DATA BASE RECOVERY CONTROL          PAGE 0002
DSP0211I  COMMAND PROCESSING COMPLETE
DSP0211I  HIGHEST CONDITION CODE = 00
```

Figure 73: DBRC NOTIFY.IC Processing report

Data Set Statistics report

The Data Set Statistics report contains statistics information about the database data set that was processed by the Image Copy function.

This report is generated in the FABJSTAT DD data set.

The following figures show examples of the Data Set Statistics report. The fields in the report vary by database type.

- “Data Set Statistics report for a full-function database” on page 315
- “Data Set Statistics report for a HALDB” on page 315
- “Data Set Statistics report for a DEDB” on page 317

Data Set Statistics report for a full-function database

```
IMS HIGH PERFORMANCE IMAGE COPY                          "HD DATA SET STATISTICS REPORT"                          PAGE:     1
5655-N45                                                 DATE: 05/12/2020  TIME: 01.10.28                     FABJMAIN - V4.R2

DBNAME: DBHDAM30  DDNAME: HDAMDD30
DATA SET GROUP SUMMARY
--------------------------------
  DBD NAME                        = DBHDAM30
  DATABASE ORGANIZATION           = HDAM
  ACCESS METHOD                   = OSAM
  DDNAME OF DATA SET              = HDAMDD30
  DATA SET GROUP NUMBER           = 01
  NUMBER OF DATA SET GROUPS       = 01
  DSNAME OF DATA SET              = RSQA.PCIC.IFPA.TSKZA.DBDS.HDAMDS30
  BLOCK SIZE                      =  2,048
  RECORD SIZE                     =  2,048
```

Figure 74: Data Set Statistics report for a full-function database

The report fields are as follows:

DBNAME

The name of the processed DBD.

DDNAME

The ddname of the processed database data set.

DBD NAME

The name of the processed DBD.

DATABASE ORGANIZATION

The database organization that is defined for the processed DBDS in the DBDLIB data set.

ACCESS METHOD

The access method of this database.

DDNAME OF DATA SET

The ddname of the processed database data set.

DATA SET GROUP NUMBER

Number of data set group members.

NUMBER OF DATA SET GROUPS

Number of data sets in the data set group.

DSNAME OF DATA SET

The name of the processed data set.

BLOCK SIZE

The block size of the database data set.

RECORD SIZE

The record size of the database data set.

Data Set Statistics report for a HALDB

```
IMS HIGH PERFORMANCE IMAGE COPY                          "HD DATA SET STATISTICS REPORT"                          PAGE:     4
5655-N45                                                 DATE: 05/12/2020  TIME: 01.10.28                     FABJMAIN - V4.R2

DBNAME: PHDV0300  PARTNAME: PHDV03A  DDNAME: PHDV03AA
DATA SET GROUP SUMMARY
--------------------------------
  DBD NAME                        = PHDV0300
  DATABASE ORGANIZATION           = PHDAM
  ACCESS METHOD                   = VSAM ESDS
  PARTITION NAME                  = PHDV03A
  PARTITION ID                    = 00001
  NUMBER OF PARTITIONS IN DATABASE = 00005
  PARTITION HIGH KEY              = C'19999999'
  DDNAME OF DATA SET              = PHDV03AA
  DATA SET GROUP ID               = A
  NUMBER OF DATA SET GROUPS       = 03
```

```
  DSNAME OF DATA SET              = RSQA.PCIC.IFPA.TSKZA.DBDS.PHDV0300.A00001
  BLOCK SIZE                      =    512
  RECORD SIZE                     =    505
IMS HIGH PERFORMANCE IMAGE COPY                          "HD DATA SET STATISTICS REPORT"                          PAGE:     5
5655-N45                                                 DATE: 05/12/2020  TIME: 01.10.28                      FABJMAIN - V4.R2

DBNAME: PHDV0300  PARTNAME: PHDV03A  DDNAME: PHDV03AB
DATA SET GROUP SUMMARY
--------------------------------
  DBD NAME                        = PHDV0300
  DATABASE ORGANIZATION           = PHDAM
  ACCESS METHOD                   = VSAM ESDS
  PARTITION NAME                  = PHDV03A
  PARTITION ID                    = 00001
  NUMBER OF PARTITIONS IN DATABASE = 00005
  PARTITION HIGH KEY              = C'19999999'
  DDNAME OF DATA SET              = PHDV03AB
  DATA SET GROUP ID               = B
  NUMBER OF DATA SET GROUPS       = 03
  DSNAME OF DATA SET              = RSQA.PCIC.IFPA.TSKZA.DBDS.PHDV0300.B00001
  BLOCK SIZE                      =  1,024
  RECORD SIZE                     =  1,017
IMS HIGH PERFORMANCE IMAGE COPY                          "HD DATA SET STATISTICS REPORT"                          PAGE:     6
5655-N45                                                 DATE: 05/12/2020  TIME: 01.10.28                      FABJMAIN - V4.R2

DBNAME: PHDV0300  PARTNAME: PHDV03A  DDNAME: PHDV03AC
DATA SET GROUP SUMMARY
--------------------------------
  DBD NAME                        = PHDV0300
  DATABASE ORGANIZATION           = PHDAM
  ACCESS METHOD                   = VSAM ESDS
  PARTITION NAME                  = PHDV03A
  PARTITION ID                    = 00001
  NUMBER OF PARTITIONS IN DATABASE = 00005
  PARTITION HIGH KEY              = C'19999999'
  DDNAME OF DATA SET              = PHDV03AC
  DATA SET GROUP ID               = C
  NUMBER OF DATA SET GROUPS       = 03
  DSNAME OF DATA SET              = RSQA.PCIC.IFPA.TSKZA.DBDS.PHDV0300.C00001
  BLOCK SIZE                      =  2,048
  RECORD SIZE                     =  2,041
```

Figure 75: Data Set Statistics report for a HALDB

The report fields are as follows:

DBNAME

The name of the processed DBD.

PARTNAME

The name of the processed HALDB partition.

DDNAME

The ddname of the processed database data set.

DBD NAME

The name of the processed DBD.

DATABASE ORGANIZATION

The database organization that is defined for the processed DBDS in the DBDLIB data set.

ACCESS METHOD

The access method of this database.

PARTITION NAME

The partition name.

PARTITION ID

The partition ID. This ID is used as the last character of the DD name.

NUMBER OF PARTITIONS IN DATABASE

The number of partitions in the database.

PARTITION HIGH KEY

The highest key in this partition.

DDNAME OF DATA SET

The ddname of the processed database data set.

DATA SET GROUP ID

The data set group ID.

NUMBER OF DATA SET GROUPS

Number of data sets in the data set group.

DSNAME OF DATA SET

The name of the processed data set.

BLOCK SIZE

The block size of the database data set.

RECORD SIZE

The record size of the database data set.

Data Set Statistics report for a DEDB

```
IMS HIGH PERFORMANCE IMAGE COPY                          "DEDB AREA STATISTICS REPORT"                          PAGE:    22
5655-N45                                               DATE: 05/12/2020  TIME: 01.10.28                     FABJMAIN - V4.R2

DBNAME: DEDBJN22  AREANAME: DB22AR3
AREA SUMMARY
--------------------------------
  DBD NAME                      = DEDBJN22
  DATABASE ORGANIZATION         = DEDB
  ACCESS METHOD                 = VSAM ESDS
  AREANAME OF DATA SET          = DB22AR3
  AREA NUMBER                   = 04
  DSNAME OF DATA SET            = RSQA.PCIC.IFPA.TSKZA.DBDS.MDB22AR3.ADS1
  BLOCK SIZE                    =  1,024
  RECORD SIZE                   =  1,017
```

Figure 76: Data Set Statistics report for a DEDB

The report fields are as follows:

DBNAME

The name of the processed DBD.

AREANAME

The area name of the processed DEDB area data set.

DBD NAME

The name of the processed DBD.

DATABASE ORGANIZATION

The database organization that is defined for the processed DBDS in the DBDLIB data set.

ACCESS METHOD

The access method of this database.

AREANAME OF DATA SET

The area name.

AREA NUMBER

The area number.

DSNAME OF DATA SET

The name of the processed area data set.

BLOCK SIZE

The block size of the area.

RECORD SIZE

The control interval size of the area.

DFSMSDSS Processing Messages report

The DFSMSDSS Processing Messages report contains processing messages issued by the DFSMSDSS data set services.

This report is generated in the DSSPRINT DD data set when the job is run with the FASTIC keyword.
The following figure is an example of the DFSMSDSS Processing Messages report.

```
 PAGE 0001     5695-DF175  DFSMSDSS V2R03.0 DATA SET SERVICES     2020.044 02:05
   PARALLEL
 ADR101I (R/I)-RI01 (01), TASKID 001 HAS BEEN ASSIGNED TO COMMAND 'PARALLEL '
```

```
  SET PATCH 42=FF
  COPY FASTREP(PREF) CONCURRENT NOTIFYCC -
ADR101I (R/I)-RI01 (01), TASKID 002 HAS BEEN ASSIGNED TO COMMAND 'SET '
    DEBUG(FRMSG(DTL)) VOLCOUNT(ANY) WAIT(0,0) -
    CATALOG REPLACEU -
       RENAMEU(RSQA.PCIC.NOREG040.HDAMDS30, -
       RSQA.PCIC.NOREG040.JCL.HDAMDD30.IC1) -
       OUTDYNAM((R1I800,3390)) -
       DATASET(INCLUDE(RSQA.PCIC.NOREG040.HDAMDS30))
ADR101I (R/I)-RI01 (01), TASKID 003 HAS BEEN ASSIGNED TO COMMAND 'COPY '
ADR109I (R/I)-RI01 (01), 2020.044 02:05:59 INITIAL SCAN OF USER CONTROL STATEMENTS COMPLETED
ADR014I (SCH)-DSSU (02), 2020.044 02:05:59 ALL PREVIOUSLY SCHEDULED TASKS COMPLETED. PARALLEL MODE NOW IN EFFECT
ADR113I (R/I)-RI01 (01), PATCH BYTE AT OFFSET 0042 = FF
ADR050I (003)-PRIME(02), DFSMSDSS INVOKED VIA CROSS MEMORY APPLICATION INTERFACE
ADR016I (003)-PRIME(01), RACF LOGGING OPTION IN EFFECT FOR THIS TASK
ADR006I (003)-STEND(01), 2020.044 02:05:59 EXECUTION BEGINS
ADR442I (003)-PREDS(01), DATA SET RSQA.PCIC.NOREG040.HDAMDS30 PREALLOCATED WITH NEW NAME RSQA.PCIC.NOREG040.JCL.HDAMDD30.IC1, IN
                         CATALOG CATALOG.RSI8.USERCAT, ON VOLUME(S): R1I800
ADR918I (003)-ALLOC(04), FAST REPLICATION COULD NOT BE USED FOR DATA SET RSQA.PCIC.NOREG040.HDAMDS30, RETURN CODE 9
                          VOLUME R1I800 WAS REJECTED FOR QFRVOLS VOLUME REASON CODE 02 - PPRC PRIM CURRENTLY ACTIVE
ADR767I (003)-T0MI (01), 2020.044 02:05:59 CONCURRENT COPY INITIALIZATION SUCCESSFUL FOR DATA SET RSQA.PCIC.NOREG040.HDAMDS30 IN
                         CATALOG CATALOG.RSI8.USERCAT.
ADR801I (003)-DDDS (01), 2020.044 02:05:59 DATA SET FILTERING IS COMPLETE. 1 OF 1 DATA SETS WERE SELECTED: 0 FAILED SERIALIZATION
                         AND 0 FAILED FOR OTHER REASONS
ADR734I (003)-DDDS (01), 2020.044 02:05:59 CONCURRENT COPY INITIALIZATION SUCCESSFUL FOR 1 OF 1 SELECTED DATA SETS. SERIALIZATION
                         FOR THIS DATA IS RELEASED IF DFSMSDSS HELD IT. THE INTERMEDIATE RETURN CODE IS 0000
ADR454I (003)-DDDS (02), THE FOLLOWING DATA SETS WERE SUCCESSFULLY PROCESSED
                          RSQA.PCIC.NOREG040.HDAMDS30
ADR006I (003)-STEND(02), 2020.044 02:05:59 EXECUTION ENDS
ADR013I (003)-CLTSK(01), 2020.044 02:05:59 TASK COMPLETED WITH RETURN CODE 0000
ADR012I (SCH)-DSSU (01), 2020.044 02:05:59 DFSMSDSS PROCESSING COMPLETE. HIGHEST RETURN CODE IS 0000
```

Figure 77: DFSMSDSS Processing Messages report

DFSMSDSS User Interaction Module (UIM) Statistics report

The DFSMSDSS User Interaction Module (UIM) Statistics report contains information about UIM processing.

The information includes:

Task ID

Task ID of the Image Copy function, that is associated with the UIM processing .

UIM start time

The time when the UIM processing started.

UIM end time

The time when the UIM processing ended.

DB/AREA name

The database or the DEDB area name that is processed by the UIM processing.

DD name

The DD name of the database that is processed by the UIM processing.

Data set name

The data set name of the database that is processed by the UIM processing.

Logical copy complete time

The time when the logical copy phase ended.

Physical copy start time

The time when the physical copy phase started.

Physical copy end time

The time when the physical copy phase ended.

This report is generated in the DSSSTATS DD data set when the job is run with the FASTIC keyword.
The following figure is an example of the DFSMSDSS User Interaction Module (UIM) Statistics report.

```
                D F S M S D S S   U S E R   I N T E R A C T I O N   M O D U L E   ( U I M )   S T A T I S T I C S


  UIM STATISTICS FOR TASK IDENTIFIER: 0001


  UIM START DATE/TIME:              20200213 02:05:59.7610
  UIM END   DATE/TIME:              20200213 02:05:59.9009

  DB/AREA: DBHDAM30 DDNAME: HDAMDD30 DSNAME: RSQA.PCIC.NOREG040.HDAMDS30
  LOGICAL  COPY COMPLETE DATE/TIME:  20200213 02:05:59.8758
  PHYSICAL COPY START    DATE/TIME:  20200213 02:05:59.8758
  PHYSICAL COPY END      DATE/TIME:  20200213 02:05:59.8925
```

Figure 78: DFSMSDSS User Interaction Module (UIM) Statistics report

Reports by HASH Check process

Full-function database HASH Check generates the STATIPRT Database Statistics report and the STATIPRT HD Data Set Statistics report.

These reports are unique to the full-function database HASH Check option. These reports are in the same format as the reports generated by HD Pointer Checker. For details, see the *IMS High Performance Pointer Checker User's Guide*.

Using IMS compatible JCL

The following topics explain how to use the functions of IMS HP Image Copy by using the JCL for IMS standard utilities.

Topics:

- "Taking image copies with IMS compatible JCL" on page 320
- "Recovering databases with IMS compatible JCL" on page 349
- "IMS HP Image Copy outputs (IMS compatible JCL)" on page 356
- "Setting default values (IMS compatible JCL)" on page 357

Taking image copies with IMS compatible JCL

The following topics explain how to take image copies with JCL stream that is coded for the DFSUDMP0 program.

IMS HP Image Copy provides an interface that enables to start IMS HP Image Copy functions with IMS compatible JCL. You can run the Image Copy function by using the JCL that is in the same format as JCL for the IMS standard utility.

The following features of IMS HP Image Copy are supported for the Image Copy function that is executed with DFSUDMP0 JCL. Other IMS HP Image Copy features are not supported.

- Compressed image copy format
- HASH Check
- High Performance I/O
- Creating multiple image copies at one time
- Site default table
- Offload workload to zIIP processors

> **Recommendation:** If you want to enable other features of IMS HP Image Copy, consider using the FABJMAIN program to invoke the Image Copy function.

Topics:

- "Features for the Image Copy function (DFSUDMP0 JCL)" on page 321
- "Considerations for the Image Copy function (DFSUDMP0 JCL)" on page 321
- "Restrictions for the Image Copy function (DFSUDMP0 JCL)" on page 322
- "Running the Image Copy function with DFSUDMP0 JCL" on page 325
- "DD statements for the Image Copy function (DFSUDMP0 JCL)" on page 332
- "DD statements for the full-function database HASH Check option (DFSUDMP0 JCL)" on page 334
- "DD statements for the DEDB HASH Check option (DFSUDMP0 JCL)" on page 336
- "Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337
- "Multiple-step HASH Check option reference" on page 338
- "Examples for taking image copies with DFSUDMP0 JCL" on page 343

Features for the Image Copy function (DFSUDMP0 JCL)

The Image Copy function that is invoked by DFSUDMP0 JCL supports the features summarized in the following table.

Table 100: Features for the Image Copy function (IMS compatible JCL)

Feature	Description	How to enable this feature
Batch image copy and concurrent image copy	IMS HP Image Copy supports two types of image copy processing; batch image copy and concurrent image copy.	"Invoking the Image Copy function through stand-alone DFSUDMP0" on page 325
Compressed image copy	A compressed image copy has the format of database records that are compressed by one of the IMS HP Image Copy compression routines. The advantage of this format is that it reduces allocation space for output image copy.	"Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337
High Performance Input/Output interface	The High Performance Input/Output (HP Input/Output or HPIO) interface reduces CPU time and usage while IMS HP Image Copy generates image copies or recovers a database.	"Invoking the Image Copy function through stand-alone DFSUDMP0" on page 325
Database pointer check (HASH Check)	The Image Copy function can check the accuracy of database pointers while it creates image copies. By enabling the Hash Check option, you need only to take image copies instead of running pointer check utilities to verify the pointers of databases. You can reduce the number of jobs for verifying the pointers of image copies taken.	"Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337
Creating two image copies at one time	The Image Copy function can create multiple image copy data sets in one run.	"Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337
Site Default Generation utility	The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs.	"Setting default values (IMS compatible JCL)" on page 357
Offloading workload to zIIP processors	IMS HP Image Copy supports the IBM® System z® Integrated Information Processor (zIIP) to offload eligible database workloads.	"Invoking the Image Copy function through stand-alone DFSUDMP0" on page 325

Considerations for the Image Copy function (DFSUDMP0 JCL)

The following considerations apply to using the Image Copy function with IMS compatible JCL.

- DBRC must be active when creating image copies of a HALDB or the IMS catalog.
- If you enable the HD Pointer Checker HASH Check option for a HALDB or the IMS catalog and use DBDs in the DBD library, you must invoke DFSUDMP0 from DFSRRC00 and specify a ULU region.
- Image copies of the HALDB primary index and ILDSs are not created.
- Image copies cannot be created for a partition data set while the integrated HALDB Online Reorganization function is reorganizing the partition.
- IMS catalog must be registered to DBRC.
- If you enable the HD Pointer Checker HASH Check option and create image copies of the IMS catalog, all partition data sets of the IMS catalog must be processed in the same job step.
- If the IMS management of ACBs is enabled, image copies of the following additional system data sets, which are used to manage the ACBs, are not created:
  - IMS directory data sets
  - Bootstrap data set
  - Staging data set
- HPIO=Y|N|X can be used only if DFSUDMP0 is invoked directly.

- To run the Image Copy function in an IMS-managed ACBs environment, the following requirements must be met:
  - The IMS catalog is registered to the DBRC RECON data sets.
  - If IMS HP Image Copy needs to access control blocks from the IMS catalog, CATALOG=YES and ACBMGMT=CATALOG are specified in the IMS Catalog Definition exit routine (DFS3CDX0).
  - The program name on the EXEC statement in the JCL is PGM=DFSUDMP0.
- In the IMS-managed ACBs environment, multiple-step HASH Check for full-function databases is not supported.

Restrictions for the Image Copy function (DFSUDMP0 JCL)

Certain restrictions apply to using the Image Copy function with IMS compatible JCL, coded for the DFSUDMP0 program.

The following are common restrictions that apply when using the IMS HP Image Copy functions:

- A HALDB requires that DBRC is active; otherwise a copy request is rejected.
- HSAM, GSAM, and MSDB databases are not supported.

Subtopics:

- "Restrictions for the Image Copy function" on page 322
- "Restrictions when the IMS management of ACBs is enabled" on page 322
- "Restrictions for single-step HASH Check (for full-function databases)" on page 323
- "Restrictions for multiple-step HASH Check (for full-function databases)" on page 324
- "Restrictions for DEDB HASH Check" on page 324

Restrictions for the Image Copy function

- The Image Copy function supports the following environments only:
  - Batch image copy
  - Concurrent image copy
- The Image Copy function does not support the functions that are provided by the following IMS utilities:
  - Online image copy
  - HSSP image copy
  - Image copy 2
  - Restart function under UCF
- A DBDS or area cannot be processed more than once in the same job step.
- A compressed image copy data set cannot be used with IMS Database Recovery utility as an input data set. Use either the Recovery function of IMS HP Image Copy or the IMS Database Recovery Facility.
- HASH Check for full-function databases is not supported for the concurrent image copy process.

Restrictions when the IMS management of ACBs is enabled

If the IMS management of ACBs is enabled and all of the following conditions are met, the input information is obtained from the IMS catalog directory:

- PGM=DFSUDMP0 is specified in the JCL.
- The IMS catalog and the IMS management of ACBs are enabled by the IMS Catalog Definition exit routine (DFS3CDX0).
- Multiple-step HASH Check for full-function databases is not supported.

Restrictions for single-step HASH Check (for full-function databases)

- For full-function databases, the Pointer to Segment Check function is not supported. Only the HASH Check option of the HD Pointer Checker is supported.
- The function cannot determine the location of pointer errors that are found during HASH Check. Run the Pointer to Segment Check function for the image copy data set in a stand-alone HD Pointer Checker job.
- All the restrictions that apply to stand-alone HD Pointer Checker HASH Check option jobs also apply to the HD Pointer Checker HASH Check processes that are invoked through the HASH Check option of the Image Copy function.
- The maximum number of databases that can be processed at a time is 2500.
- A pointer value must correspond to the RBA of the segment to which the pointer points. Also, the sum of the pointer values for a specific pointer type must correspond to the sum of the RBAs of the given segment type.
- The locations of errors cannot be determined precisely.
- Theoretically, the errors in the pointer value, if there are any, are compensated for because it is the sum of the values that are actually compared. The probability of such a compensation, however, is extremely low.
- HASH Check cannot detect the following pointer-type errors:
  - Physical parent pointers that are not at the beginning or end of their twin chain
  - Direct address pointers in a HISAM database that chain the logical records from a primary to an overflow data set or the logical records in the overflow data set.
- For HALDBs, the HASH Check option has the following restrictions:
  - It can validate only physical pointers. It cannot validate logical relationships.
  - It does not provide the ability to analyze a PSINDEX database or a PHIDAM primary index database.
  - It cannot detect the following pointer-type errors:
    - Logical parent pointers and paired logical child pointers that reside in an Extended Pointer Set (EPS)
    - Indirect pointers that reside in the Indirect List Data Set (ILDS)
- For non-HALDBs, you must specify all logically related databases and indexes in the same step of HASH Check. In that same step, if you prefer, you can also specify databases that are not logically related or that have no index relationships.
- In an image copy job, the maximum number of tasks for a HASH Check is 99.
- Secondary index database can be checked.
  - The sum of RBA values in index pointer segments is checked with the sum of RBA of the index target segments when one of the following conditions is satisfied:
    - The index source segment equals to the index target segment.
    - The index target segment is the parent of the index source segment, and the source segment has a PP pointer. However, if the index source segment is split into the prefix and data, and sparse indexing is defined for the source segment, only the number of pointer segments is checked. The RBA values are not checked.
- Considerations for secondary indexes are as follows:
  - If a secondary index database maintenance exit routine is defined for the source segment, store the load module in the IMS2 DD data set. If no load module is in the IMS2 DD data set, only the statistics reports are printed, but no pointer segment is checked.
  - Segment edit/compression exit routine is not called by HD Pointer Checker, even if they are defined for the index source segment. Therefore, only the statistics report is printed, but no pointer segment is checked when one of the following conditions apply:
    - A segment edit/compression exit routine and a sparse indexing are defined for the source segment.

- The source segment is of variable length, and a segment edit/compression exit routine is defined for it.

- The segments cannot be checked when some of the index source segments are suppressed, split to the prefix and data portions, and physically deleted. Thus, only the statistics reports are printed.

- HASH Check does not support PSINDEX databases. If a PSINDEX database is provided as an input, the Image Copy function creates image copies but IMS HP Pointer Checker issues a warning message and ignores the PSINDEX database. The Image Copy function continues processing the next database.

Restrictions for multiple-step HASH Check (for full-function databases)

- For full-function databases, the Pointer to Segment Check function is not supported. Only the HASH Check option of the HD Pointer Checker is supported.
- The function cannot determine the location of pointer errors that are found during HASH Check. Run the Pointer to Segment Check function for the image copy data set in a stand-alone HD Pointer Checker job.
- All the restrictions that apply to stand-alone HD Pointer Checker HASH Check option jobs also apply to the HD Pointer Checker HASH Check processes that are invoked through the HASH Check option of the Image Copy function.
- If you process HD Pointer Checker HASH with HALDB by the DFSUDMP0 interface, run DFSUDMP0 from DFSRRC00 as an ULU region.
- The maximum number of databases that can be processed at a time is 2500.
- A pointer value must correspond to the RBA of the segment to which the pointer points. Also, the sum of the pointer values for a specific pointer type must correspond to the sum of the RBAs of the given segment type.
- The locations of errors cannot be determined precisely.
- Theoretically, the errors in the pointer value, if there are any, are compensated for because it is the sum of the values that are actually compared. The probability of such a compensation, however, is extremely low.
- The HASH Check option cannot detect the following pointer-type errors:
  - Physical parent pointers that are not at the beginning or end of their twin chain
  - Direct address pointers in a HISAM database that chain the logical records from a primary to an overflow data set or the logical records in the overflow data set.
- In HALDB, the HASH Check option has the following restrictions:
  - It can validate physical pointers only. It cannot validate logical relationships.
  - It does not provide the ability to analyze a PSINDEX database or a PHIDAM primary index database.
  - It cannot detect the following pointer-type errors:
    - Logical parent pointers and paired logical child pointers that reside in an Extended Pointer Set (EPS)
    - Indirect pointers that reside in the Indirect List Data Set (ILDS)
- To process HALDB, run program FABPHCTL (by specifying PGM=DFSRRC00) in the DLI region. Specify Y for DBRC.

```
// EXEC PGM=DFSRRC00,
//      PARM='DLI,FABPHCTL,psbname,,,,,,,,,,Y,N'
```

- Secondary index databases cannot be checked.

Restrictions for DEDB HASH Check

- The Pointer to Segment Check function is not supported. Only the HASH Check option of the DEDB Pointer Checker is supported.
- The function cannot determine the location of pointer errors that are found during HASH Check. Use the Pointer to Segment Check function against the image copy data set in a stand-alone DEDB Pointer Checker job.

- All restrictions that apply to stand-alone DEDB Pointer Checker HASH Check option jobs also apply to the DEDB Pointer Checker HASH Check option that is enabled in Image Copy function jobs.
- A pointer value must correspond to the RBA of the segment to which the pointer points. The sum of the pointer values for a specific pointer type must also correspond to the sum of the RBAs of the given segment type.
- The location of errors cannot be determined precisely.
- Pointer value errors might theoretically compensate, but the probability of making such a compensation is extremely low.

Running the Image Copy function with DFSUDMP0 JCL

You can run the Image Copy function of IMS HP Image Copy to create image copies by using a JCL stream that is coded for the DFSUDMP0 program.

About this task

There are two ways to invoke the DFSUDMP0 program:

Invoke the stand-alone DFSUDMP0 by specifying EXEC DFSUDMP0

If you want to use one of the following functions with IMS compatible JCL, use the stand-alone DFSUDMP0.

- Create a concurrent image copy (CIC)
- Use High Performance Input/Output interface (HPIO)
- Invoke the IMS HP Image Copy compression routine in zIIP processor

Invoke DFSUDMP0 by using the IMS Region Controller program (DFSRRC00)

If you want to enable the single-step HASH Check option for HALDBs, invoke DFSUDMP0 by using the IMS Region Controller program (DFSRRC00).

Invoking the Image Copy function through stand-alone DFSUDMP0

To invoke the stand-alone DFSUDMP0 to take image copies, complete the following steps.

Procedure

1. In the DFSUDMP0 JCL, code the EXEC statement as follows:

```
// EXEC PGM=DFSUDMP0,PARM='options'
```

where *options* can be:

CIC

Creates concurrent image copies of OSAM and VSAM ESDS database data sets.

If you specify CIC, you must specify DBRC=Y for full-function databases. For Fast Path databases, CIC can be specified with DBRC=N. However, the generated image copies are not to be used for database recovery.

COMPMODE=COND|N

The COMPMODE keyword controls the priority of the compression methods for compressing the output image copy data sets. This keyword also controls the Improved Data Recording Capability (IDRC) feature for the tape volume where the output image copies are generated.

DBRC=Y | N

Specifies whether or not the Image Copy function uses DBRC.

HPIO=Y | N

Specifies whether or not to use the HP Input/Output interface to read a database.

Y specifies that the HP Input/Output methods are to be used.

HP Input/Output uses EXCP for input and output OSAM data sets and for input VSAM ESDS data sets. This keyword is ignored for other types of data sets and for concurrent image copy generation for VSAM ESDS of full-function databases.

The basic access methods are used in these cases.

If you specify HPIO=Y, all the load libraries of IMS HP Image Copy must be APF-authorized.

If you specify a value other than Y or N, the Image Copy function issues messages DFS310A and DFS391I and ends with an error.

ZIIPMODE=COND | NEVER

Specifies whether to offload some workload to zIIP processors.

COND

Specifies that IMS HP Image Copy offloads some workload to zIIP processors. COND is effective only when available zIIP processors are found. Otherwise, the job is run on the main CPs.

NEVER

Specifies that IMS HP Image Copy does not offload any workload to zIIP processors. NEVER is the default to avoid unexpected performance degradation.

If you specify ZIIPMODE=COND, you must add the SGLXLOAD library of IMS Tools Base to the STEPLIB. All the load libraries of IMS HP Image Copy must be APF-authorized.

For considerations for using zIIP processors, see "Offload workload to zIIP processors" on page 50.

GSGNAME=*gsgname*

An optional 1- to 8-character name that identifies the global service group.

IMSPLEX=*plexname*

Specifies which IMSplex DBRC should join.

The IMSPLEX parameter can be specified on all job steps that use DBRC.

DBRCGRP=*xxx*

Specifies the DBRC group ID defined in the RECON data set used by the DBRC group.

2. Code the load module library in the STEPLIB DD statement.
STEPLIB DD statement points to two load module library data sets. These module library data sets must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

where:

HPS.SHPSLMD0

The name of the library that contains the IMS HP Image Copy load modules.

IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

If you want to use the site default table to apply the control statement parameters that you defined in the table, specify the library that contains the site default table to the STEPLIB concatenation.

> **Important:** Ensure that you specify the site default table that is created for IMS compatible JCL jobs. For more information about creating a site default table and setting default values for IMS compatible JCL jobs, see "Setting default values (IMS compatible JCL)" on page 357.

If you specify HPIO=Y, the load module libraries of IMS HP Image Copy must be APF-authorized.

When you enable the HASH Check option of IMS HP Image Copy, you must concatenate the following libraries to the STEPLIB DD statement:

- If the HASH Check option is enabled for full-function databases, the load module library of IMS HP Pointer Checker.

- If the HASH Check option is enabled for Fast Path databases, the load module library of IMS HP Fast Path Utilities.

If IMS HP Pointer Checker is called with HOMECHK, CHAINDIST, or COMPFACT option, you must specify the library that contains the randomizer or the segment edit/compression routine.

When you request to schedule the compression routine of IMS HP Image Copy in zIIP processor, you must concatenate the SGLXLOAD library of IMS Tools Base to the STEPLIB, and APF-authorize all the libraries that are specified to the STEPLIB.

If STEPLIB is unauthorized because it specifies the libraries concatenated to IMS.SDFSRESL, you must include a DFSRESLB DD statement.

3. Code the appropriate DD statements. For a list of DD statements, see "DD statements for the Image Copy function (DFSUDMP0 JCL)" on page 332.
4. Code the corresponding control statement in the SYSIN data set. For control statements, see "Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337.
   Examples are provided in "Examples for taking image copies with DFSUDMP0 JCL" on page 343.
5. Submit the JCL.

Invoking the Image Copy function through DFSRRC00

To invoke the Image Copy function through DFSUDMP0 through the IMS Utility region controller DFSRRC00 to create image copies, complete the following steps.

Procedure

1. In the DFSRRC00 JCL, code the EXEC statement as follows:

```
// EXEC PGM=DFSRRC00,PARM='ULU,DFSUDMP0,options'
```

   The parameters on the PARM statement are the positional parameters. You must code the appropriate parameters on the specific position. Some parameters can be omitted, but each position must be separated by a comma (,).

   First position

   ULU or UDR

   - ULU: Utility region identifier
   - UDR: Recovery region identifier

   Second position

   Program name. You must code DFSUDMP0.

   Third position

   DBD name. If you use UDR, you must specify the name of the DBD to be processed by the IMS HP Image Copy function. If you use ULU, DBD name can be omitted.

   14th position

   Y or N. Specifies whether the IMS HPIC Image Copy function uses DBRC.

2. Code the load module library in the STEPLIB DD statement.
   STEPLIB DD statement points to two load module library data sets. These module library data sets must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

   where:

   HPS.SHPSLMD0

   The name of the library that contains the IMS HP Image Copy load modules.

   IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

If you want to use the site default table to apply the control statement parameters that you defined in the table, specify the library that contains the site default table in the STEPLIB concatenations.

> **Important:** Ensure that you specify the site default table that is created for IMS compatible JCL jobs. For more information about creating a site default table and setting default values for IMS compatible JCL jobs, see "Setting default values (IMS compatible JCL)" on page 357.

When you enable the HASH Check option of IMS HP Image Copy, you must concatenate the following libraries to the STEPLIB DD statement:

- If the HASH Check option is enabled for full-function databases, the load module library of IMS HP Pointer Checker.
- If the HASH Check option is enabled for Fast Path databases, the load module library of IMS HP Fast Path Utilities.

If IMS HP Pointer Checker is called with HOMECHK, CHAINDIST, or COMPFACT option, you must specify the library that contains the randomizer or the segment edit/compression routine.

If STEPLIB is unauthorized because it specifies libraries concatenated to IMS.SDFSRESL, you must include a DFSRESLB DD statement.

3. Code the appropriate DD statements. For a list of DD statements, see "DD statements for the Image Copy function (DFSUDMP0 JCL)" on page 332.
4. Code the corresponding control statement in the SYSIN data set. For control statements, see "Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337.
   Examples are provided in "Examples for taking image copies with DFSUDMP0 JCL" on page 343.
5. Submit the JCL.

Enabling full-function single-step HASH Check option with DFSUDMP0

To run single-step HASH Check while the function creates image copies, you must prepare a cataloged procedure, and specify additional DD statements and control statement keywords in the DFSUDMP0 JCL.

Procedure

1. Prepare a cataloged procedure for the single-step HASH Check option.
   Use the IBM® supplied cataloged procedure that is shown in the following figure or prepare a similar procedure of your own.
   Figure 79: FABJICHE cataloged procedure

```
//FABJICHE PROC HPICLIB='HPIC.SHPSLMD0',        HPIC LOAD LIBRARY
//             HPPCLIB='HPPC.SHPSLMD0',         HPPC LOAD LIBRARY
//             RESLIB='IMSVS.SDFSRESL',         IMS RESLIB
//             DBDLIB='IMSVS.DBDLIB',           IMS DBD LIBRARY
//             HPPCSRC='HPPC.SHPSSAMP(FABPVSAM)', HPPC SAMPLE JCL LIBRARY
//             PRTBLK=6118   (133*46)       BLKSIZE OF PRINT DATA SETS
//*-------------------------------------------------------------------
//IICPRO EXEC PGM=DFSUDMP0
//STEPLIB   DD DISP=SHR,DSN=&HPICLIB
//          DD DISP=SHR,DSN=&HPPCLIB
//          DD DISP=SHR,DSN=&RESLIB
//*-------------------------------------------------------------------
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------
//DFSRESLB  DD DISP=SHR,DSN=&RESLIB
//IMS       DD DISP=SHR,DSN=&DBDLIB
//DFSPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//*-------------------------------------------------------------------*
//* REPORTS
//*-------------------------------------------------------------------*
//ICEPRINT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//PRIMAPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//STATIPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
```

```
//VALIDPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//EVALUPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SNAPPIT   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SUMMARY   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSOUT    DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSUDUMP  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
```

2. Prepare DFSUDMP0 JCL by following the steps described in "Invoking the Image Copy function through stand-alone DFSUDMP0" on page 325.
   To enable the single-step HASH Check option, make the specification in the SYSIN control statement by referring to "Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337, and add additional DD statements that are required for the single-step HASH Check option.

   > **Note:** Do not specify DBDEFCTL for the DFSUDMP0 JCL. If DBDEFCTL is specified, it is regarded as multiple-step HASH Check.

3. Submit the JCL.

Enabling full-function multiple-step HASH Check option with DFSUDMP0

To run multiple-step HASH Check, you need to run the DBD Analysis program, the Image Copy job, and then the HASH Evaluation program.

Procedure

1. Generate a DBDEFCTL data set.
   To make the HD Pointer Checker HASH Check option available for image copy, you must prepare a DBDEFCTL data set before the image copy execution. To do this, run the HD Pointer Checker DBD Analysis program on all databases whose pointers you want to validate with HASH Check.

   To run the DBD Analysis program, use the IBM® supplied cataloged procedure that is shown in the following figure, or prepare a similar procedure of your own.

   Examples in "Examples for enabling the HD Pointer Checker HASH Check option" on page 345 assume that the IBM® supplied cataloged procedure is used.
   Figure 80: FABPDA cataloged procedure

```
//FABPDA  PROC PSB=,                          PSBNAME
//        DBRC=N,                             DBRC=Y IF HALDB PROCESS
//        PRTBLK=6118,  (133*46)              BLKSIZE OF PRINT DATA SETS
//        DBDLIB='IMSVS.DBDLIB',              IMS DBD LIBRARY
//        PSBLIB='IMSVS.PSBLIB',              IMS PSB LIBRARY
//        RESLIB='IMSVS.SDFSRESL',            IMS RESLIB
//        DBTLIB='HPS.SHPSLMD0',              HPS LOAD LIBRARY
//        DBTSRC='HPS.SHPSSAMP(FABPVSAM)',    HPS SAMPLE JCL LIBRARY
//        DBDEFC='HPS.DBDEFCTL'               OUTPUT DBDEFCTL DSNAME
//*--------------------------------------------------------------------*
//HDPCPRO EXEC PGM=DFSRRC00,
//             PARM='DLI,FABPANAL,&PSB,,,,,,,,,,&DBRC,N'
//STEPLIB   DD DSN=&DBTLIB,DISP=SHR
//          DD DSN=&RESLIB,DISP=SHR
//*--------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*--------------------------------------------------------------------*
//IMS       DD DSN=&PSBLIB,DISP=SHR
//          DD DSN=&DBDLIB,DISP=SHR
//DFSRESLB  DD DSN=&RESLIB,DISP=SHR
//DFSVSAMP  DD DSN=&DBTSRC,DISP=SHR
//IEFRDER   DD DUMMY
//SYSPRINT  DD SYSOUT=A
//*--------------------------------------------------------------------*
//* REPORTS
//*--------------------------------------------------------------------*
//PRIMAPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SNAPPIT   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSUDUMP  DD SYSOUT=A
//*--------------------------------------------------------------------*
//* FOR DBD ANALYSIS OUTPUT
```

```
//*-------------------------------------------------------------------*
//DBDEFCTL  DD DSN=&DBDEFC,DISP=OLD
//*-------------------------------------------------------------------*
```

Note: The DBDEFCTL data set that is created with an earlier release of IMS HP Pointer Checker can also be used.

The jobs create HASH records that are to be received as input by the HASH Evaluation program job.
To prepare a procedure of your own, do as follows:

a. Prepare the JCL for the DBD Analysis program job.
In the DBD Analysis program JCL, code the EXEC statement as follows:

```
//      EXEC PGM=DFSRRC00,PARM='DLI,FABPANAL,psbname,,,,,,,,,,dbrc,N'
```

The format of the PARM parameter is the same as the format used in the DLIBATCH procedure. Only the parameters shown need be coded. The variable *psbname* must be defined as a PSB with LANG=ASSEM or LANG=COBOL. It must (either directly or indirectly) refer to all input databases to be scanned by the Image Copy function with the HASH Check option. The number of databases that are referred to in a PSB must be less than 2500.

Because the DBD Analysis program is run as a DL/I batch program, you must not use a PSB that contains a PCB statement with a DEDB or an MSDB. If you do, the job abends with a 1001 code.

For HALDBs, the DBRC parameter is needed and must be Y.

b. Code the appropriate DD statements and control statements.
The DD statements that can be used for the DBD Analysis program are provided in "DBD Analysis program reference" on page 102.

The DBD Analysis program job must be run with the utility control statements that include the DATABASE statements for all database data sets that are to be evaluated. This job creates the DBDEFCTL data set that is required for both the Image Copy jobs of IMS HP Image Copy and the HASH evaluation job. The created DBDEFCTL data set can be used repeatedly for such jobs as:

- Adding or deleting a database for evaluation.
- Changing the PSB or DBD of a database.

c. Submit the JCL.

2. Prepare the JCL by following the steps that are described in "Invoking the Image Copy function through stand-alone DFSUDMP0" on page 325 and run Image Copy jobs for all database data sets.
To enable the multiple-step HASH Check option, specify HDPC=Y and additional DD statements that are required for the multiple-step HASH Check option. The DD statements are described in "DD statements for the full-function database HASH Check option (DFSUDMP0 JCL)" on page 334.

Notes:

a. For HALDB, the DBRC parameter is needed and must be Y.

b. The DBDEFCTL DD statement in the Image Copy job JCL of IMS HP Image Copy invokes the HASH Check option of HD Pointer Checker. If you want to suppress this option, delete this DD statement or specify DUMMY.

c. You can use the GENJCL.IC command to generate the Image Copy job JCL. Issue the following GENJCL.IC command to activate the HASH Check option:

```
GENJCL.IC DBD(DBDNAME1) DDN(DDNAME1) -
USERKEYS((Y'))
```

3. Run the HASH Evaluation program.

Run a HASH Evaluation program job with all the SORTEX data sets that were created by the Image Copy jobs of IMS HP Image Copy. The HASH Evaluation program job must be run with the concatenated input of all HASH records created by the Image Copy job of IMS HP Image Copy.

To run the HASH Evaluation program, use the IBM® supplied cataloged procedure that is shown in the following figure, or prepare a similar procedure of your own.

Examples in "Examples for enabling the HD Pointer Checker HASH Check option" on page 345 assume that the IBM® supplied cataloged procedure is used.

Figure 81: FABPHE cataloged procedure

```
//FABPHE  PROC PSB=,                          PSBNAME
//        DBRC=N,                             DBRC=Y IF HALDB PROCESS
//        U=SYSDA,
//        CYL='1,1',                          SPACE FOR  WORK DATA SETS
//        PRTBLK=6118,  (133*46)              BLKSIZE OF PRINT DATA SETS
//        DBDLIB='IMSVS.DBDLIB',              IMS DBD LIBRARY
//        PSBLIB='IMSVS.PSBLIB',              IMS PSB LIBRARY
//        RESLIB='IMSVS.SDFSRESL',            IMS RESLIB
//        DBTLIB='HPS.SHPSLMD0',              HPS LOAD LIBRARY
//        DBTSRC='HPS.SHPSSAMP(FABPVSAM)',    HPS SAMPLE JCL LIBRARY
//        DBDEFC='HPS.DBDEFCTL',              INPUT DBDEFCTL DATA SET
//        SORTEX='HPS.SORTEX'                 INPUT HASH RECORD DATA SET
//*--------------------------------------------------------------------*
//HDPCPRO EXEC PGM=DFSRRC00,
//             PARM='DLI,FABPHCTL,&PSB,,,,,,,,,,&DBRC,N'
//STEPLIB   DD DSN=&DBTLIB,DISP=SHR
//          DD DSN=&RESLIB,DISP=SHR
//*--------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*--------------------------------------------------------------------*
//IMS       DD DSN=&PSBLIB,DISP=SHR
//          DD DSN=&DBDLIB,DISP=SHR
//DFSRESLB  DD DSN=&RESLIB,DISP=SHR
//DFSVSAMP  DD DSN=&DBTSRC,DISP=SHR
//IEFRDER   DD DUMMY
//SYSPRINT  DD SYSOUT=A
//*--------------------------------------------------------------------*
//* REPORTS
//*--------------------------------------------------------------------*
//SYSPRINT  DD SYSOUT=A
//PRIMAPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//EVALUPRT  DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SUMMARY   DD SYSOUT=A,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SYSUDUMP  DD SYSOUT=A
//*--------------------------------------------------------------------*
//* HASH EVALUATION INPUT DATA SET
//*--------------------------------------------------------------------*
//DBDEFCTL  DD DSN=&DBDEFC,DISP=SHR
//SORTIN    DD DSN=&SORTEX,DISP=SHR
```

To prepare a procedure of your own, do as follows:

a. Prepare the JCL for the HASH Evaluation program job.
   In the HASH Evaluation program JCL, code the EXEC statement as follows:

   If all databases are non-HALDB, this statement must be in the following format:

   ```
   //      EXEC PGM=FABPHCTL
   ```

   If any one of the databases is a HALDB, this statement must be in the following format:

   ```
   //      EXEC PGM=DFSRRC00,
   //           PARM='DLI,FABPHCTL,psbname,,,,,,,,,,Y,N'
   ```

b. Code the appropriate DD statements.
   The DD statements that can be used for the HASH Evaluation program are provided in "HASH Evaluation program reference" on page 105.

c. Submit the JCL.

Enabling DEDB HASH Check option with DFSUDMP0

To enable the HASH Check option in an image copy job of IMS HP Image Copy for DEDB area data sets, you must specify additional DD statements.

Procedure

1. Prepare DFSUDMP0 JCL by following the steps described in "Invoking the Image Copy function through stand-alone DFSUDMP0" on page 325.
   To use the DEDB HASH Check option, make the specification in the SYSIN control statement by referring to "Control statements for the Image Copy function (DFSUDMP0 JCL)" on page 337, and add additional DD statements that are required for the DEDB HASH Check option.

   For a list of DD statements, see "DD statements for the DEDB HASH Check option (DFSUDMP0 JCL)" on page 336. Examples are provided in "Example for enabling the DEDB HASH Check option" on page 348.
2. Submit the JCL.
   The DEDB Pointer Checker is invoked for each area indicated in the utility control statement.

DD statements for the Image Copy function (DFSUDMP0 JCL)

DD statements are used to identify the source of input and the placement of output information. The following DD statements are supported for the Image Copy function that is called from IMS compatible JCL.

Table 101: DD statements for the DFSUDMP0 JCL

DDNAME	Use	Format	Required or optional
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMS	Input	PDS	Required (See Note 1)
SYSPRINT	Output	SYSOUT	Required
SYSIN	Input	LRECL=80	Required
datain	Input		Required
dataout1	Output	VBS (See Note 2)	Required
dataout2	Output	VBS (See Note 2)	Optional
SYSABEND or SYSUDUMP	Output	N/A	Optional
RECON1	Input/output	KSDS	Optional
RECON2	Input/output	KSDS	Optional
RECON3	Input/output	KSDS	Optional

Notes:

1. IMS DD statement is not required when the IMS management ACBs is enabled.
2. The record format of both *dataout1* and *dataout2* is VBS, whereas in the original Image Copy utility it is FB.

STEPLIB DD

This statement points to two load module library data sets. The data sets must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

where:

HPS.SHPSLMD0

The name of the library that contains the load modules of IMS HP Image Copy.

IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

To enable IMS-managed ACBs, you must include the IMS Tools Generic Exits library in the STEPLIB concatenation.

To use IMS HP Image Copy site default table, you must specify the library that contains the IMS HP Image Copy site default table.

If STEPLIB is unauthorized because it specifies libraries concatenated to IMS.SDFSRESL, you must specify a DFSRESLB DD statement.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMS DD

This statement defines the library that contains the DBD describing the database to dump, generally DSNAME=IMS.DBDLIB. The data set must reside on a direct-access volume.
This statement is not required when the IMS management ACBs is enabled.

SYSPRINT DD

This statement defines the output messages data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 121.

SYSIN DD

This statement defines the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input steam (DD * or DD DATA).

***datain* DD**

This statement defines the input data set to be dumped. The ddname on this statement must be the same as the one in the DBD that describes this data set. The ddname must also appear in the utility control statement. One DD statement of this type must be present for each data set that is dumped. The data set must reside on a direct-access volume.
If the buffer size specifications are omitted, the Image Copy function allocates the optimized data buffer for VSAM or OSAM data sets. You can modify the buffer size by specifying:

- The data set's BUFFERSPACE
- The BUFSP/BUFND in the AMP parameter on the DD statement for OSAM
- The BUFNO in the DCB parameter on the DD statement

The Image Copy function requests that VSAM data buffers and VSAM control blocks reside in virtual storage above 16 MB. OSAM data buffers are obtained above 16 MB in the DFSMS/MVS™ environment, and below 16 MB in the DFP environment.

The minimum block size for the data set is 69; smaller data sets are padded with blanks.

***dataout1* DD**

This statement defines the first copy of the dumped output data set. One DD statement is required for each data set to be dumped. The ddname can be any 1- to 8-character string, but the ddname must appear in the associated utility control statement. The output device must be either direct access or tape. Standard labels must be used. If the track size of the output direct-access device exceeds 32 KB and no DCB is explicitly specified, the BLKSIZE where multiple blocks can reside in a track is used as the default value, unless the database record length is larger than the capacity of a half track. If BLKSIZE is specified in the JCL, that BLKSIZE is used.
The Image Copy function allocates the optimized data buffer for OSAM data sets, if the buffer size parameter is omitted. You can modify the buffer size by specifying:

- The BUFNO in the DCB parameter of the DD statement

OSAM data buffers are obtained above 16 MB in the DFSMS™ environment, and below 16 MB in the DFP environment.

***dataout2* DD**

This statement is required only if the associated utility control statement requests two copies of the dump. The name must appear in the control statement. The name must be either that of the tape or the direct-access device. Standard labels must be used. If the track size of the output direct-access device exceeds 32 KB and no DCB is explicitly specified, the BLKSIZE where multiple blocks can reside in a track is used as the default value, unless the database record length is larger than the capacity of a half track. If BLKSIZE is specified in the JCL, that BLKSIZE is used.
The Image Copy function calculates the optimized data buffer for OSAM data sets, if the buffer size parameter is omitted. You can modify the buffer size by specifying:

- The BUFNO in the DCB parameter of the DD statement

OSAM data buffers are obtained above 16 MB in the DFSMS™ environment, and below 16 MB in the DFP environment.

If either of the two output copies has an "open" problem (message DFS301A) or fails the first PUT operation to either output data set (message DFS319A), the current control statement is terminated and the next control statement is processed.

Once the utility processes the first PUT, all I/O errors to either output data set return a code of 08, and the utility continues to copy to the remaining output data set. Each image copy control statement is treated as an independent copy, with the final return code being the highest received for the job.

SYSABEND DD

SYSUDUMP DD

These statements define a dump data set. If both statements are present, the last occurrence is used for the dump.

RECON1 DD

RECON2 DD

RECON3 DD

These statements define the DBRC RECON data sets. These RECON data sets must be the RECON data sets used by the control region. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

DD statements for the full-function database HASH Check option (DFSUDMP0 JCL)

When you use the HD Pointer Checker HASH Check option, you need to specify in your DFSUDMP0 JCL, the appropriate DD statements for the HD Pointer Checker HASH Check option.

These DD statements are required only if you use the HD Pointer Checker HASH Check option through the HASH exit of the Image Copy function.

The following table summarizes the DD statements for HD Pointer Checker.

Table 102: HD Pointer Checker HASH DD statements (DFSUDMP0)

DDNAME	Use	Format	Required or optional with the HASH Check option
DBDEFCTL	Input	PDS	Required (See Note)
PRIMAPRT	Output	LRECL=133	Required
STATIPRT	Output	LRECL=133	Required
VALIDPRT	Output	LRECL=133	Required
FSESTAT	Input/output	LRECL=134	Required
SNAPPIT	Output	LRECL=133	Required
SORTEX	Output	LRECL=40	Required
IMS2	Input	PDS	Optional
HISTORY	Input/Output	VSAM KSDS	Optional

DDNAME	Use	Format	Required or optional with the HASH Check option

> **Note:** DBDEFCTL is required only for the HD Pointer Checker. If you want to suppress the invocation of the HD Pointer Checker HASH Check option, delete this statement or specify DUMMY.

DBDEFCTL DD

This statement defines the input partitioned data set that was created by the HD Pointer Checker DBD Analysis program. This data set specification is a trigger for HD Pointer Checker HASH Check option invocation. If this data set is specified, the Image Copy function invokes the HD Pointer Checker HASH Check option. If you want to suppress the invocation of the HD Pointer Checker HASH Check option, delete this statement or specify DUMMY.
This statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. This data set contains database definitions for each database as a PDS member named with each DBD name, and the process control information for the HD Pointer Checker HASH Check option. Specify the member name of the process control information with the DATASET (or DSN) keyword as follows:

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL(member)
```

If the member name is omitted (see the following example), the default member name PROCTL01 is used for the control information.

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL
```

This data set contains members of all databases that take part in the logical relationship and must be evaluated at the same time. For details about preparing this data set, see "DBD Analysis program reference" on page 102.

PRIMAPRT DD

This statement defines the output data set that contains primary reports generated by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM HASH Check option processes. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

STATIPRT DD

This statement defines the output data set that contains the statistics reports generated for HISAM, HDAM, HIDAM, PHDAM, and PHIDAM. This statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

VALIDPRT DD

This statement defines the output data set that contains the legend and the validation reports produced by the HISAM, INDEX, HDAM, HIDAM, PHDAM, and PHIDAM HASH Check option processes. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

SNAPPIT DD

This statement defines the output data set that contains the block maps and block dumps that the HDAM, HIDAM, HDAM, and PHIDAM scan processes produce. The block maps and block dumps are produced when the HDAM HIDAM, HDAM, and PHIDAM scan process detects pointer errors, incorrect FSEAPs or FSEs, or T2 errors. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option. If BLKSIZE is coded on the DD statement, it must be a multiple of 133.

FSESTAT DD

This statement defines the work data set used by the HDAM, HIDAM, HDAM, and PHIDAM scan processes. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option in multiple steps. If BLKSIZE is coded on the DD statement, it must be a multiple of 134.

SORTEX DD

This statement defines the output data set that contains the 40 byte records written by the HISAM, INDEX, HDAM, HIDAM, HDAM, and PHIDAM processes. It contains one record for each pointer type of each segment type, and one record for each segment type. This data set is used as the input data set for a

subsequent EVALUATE process. The statement is required if you want to run the Image Copy function with the HD Pointer Checker HASH Check option in the multiple-step HASH Check. LRECL must be 40, and BLKSIZE must be a multiple of 40.

IMS2 DD

This statement defines the library that contains the FABPZWTO user exit, the partition selection exit module, or both. The data set must reside on a direct-access volume. It is required if you want to use FABPZWTO, the partition selection exit, or both.

HISTORY DD

This optional data set defines the HISTORY data set (VSAM KSDS) that is used as input to the DB Historical Data Analyzer and Space Monitor of IMS HP Pointer Checker. When the HISTORY option is specified, this data set is required, and must be allocated and initialized by the DB Historical Data Analyzer utility before you run IMS HP Image Copy. DISP=SHR must be used. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

DD statements for the DEDB HASH Check option (DFSUDMP0 JCL)

These DD statements are used only if you enable the DEDB Pointer Checker HASH Check option through the HASH exit of the Image Copy function.

Table 103: DEDB Pointer Checker HASH DD statements (DFSUDMP0)

DDNAME	Use	Format	Required or optional with the HASH Check option
MSGOUT	Output	LRECL=133	Required
REPORTS	Output	LRECL=133	Required
SNAPDPIT	Output	LRECL=133	Required
SORTIN	Output	LRECL=12	Optional
SORTOUT	Output	LRECL=12	Optional
SORTWK*nn*	Work	N/A	Required
SYSOUT	Output	N/A	Required

MSGOUT DD

This statement defines the output data set for DEDB Pointer Checker messages.

REPORTS DD

This statement defines the output data set for the Pointer Chain Reconstruction report of the DEDB Pointer Checker. The data set can reside on a direct-access device or printer, or be routed through the output stream.

SNAPDPIT DD

This statement defines the output data set for the DEDB CI map or CI dump report. The data set can reside on a direct-access device or can be routed through the input stream.

SORTIN or SORTOUT DD

These DD statements define the work data sets used for the subset pointer check function of the DEDB Pointer Checker. If you want to use the data space for the subset pointer check, or if you do not want to use the subset pointer check function at all, you can omit these DD statements.

SORTWK*nn* DD

These DD statements define the intermediate storage data sets used by DFSORT™. For more information about SORTWK*nn* DD statements, see *DFS™ Application Programming Guide*. Allocating a space twice the size used by the SORTIN data set is usually adequate for each work data set.

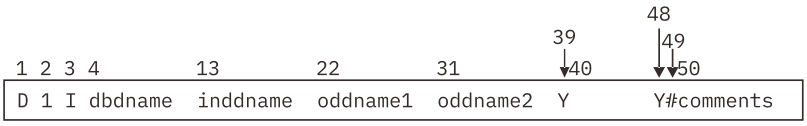
SYSOUT DD

This statement defines the output data set for DFSORT™ messages.

Control statements for the Image Copy function (DFSUDMP0 JCL)

The control statements for the Image Copy function that is invoked through IMS compatible JCL must reside in the SYSIN data set.

The utility control statement for the Image Copy function using IMS compatible JCL uses a fixed format as shown in the following figure:



Notes:

- You must not specify the SYSIN control statement if you are using the FABJMAIN program.
- The position after column 38 changes after the Image Copy function processing.

Position
Description

1

The field ID
Specify the character `D`, which identifies the statement as an IMS HP Image Copy control statement.

2

Number of copies
Specify 1 or 2, depending on the number of copies required.

3

Blank or character `I`
If `I` is coded, an image copy of index of KSDS is requested, and position 13 must be the KSDS ddname. The I option is not applicable for OSAM data sets. If position 3 is blank, and if position 13 specifies the ddname for the KSDS, an image copy of the KSDS is produced.

Image copy and recovery of an embedded index of a KSDS are not possible. However, a normal full recovery of the KSDS rebuilds an embedded index and the KSDS data area.

4-11

DBD name
Specify the name of the physical DBD that includes the name of the data set to be dumped.

13-20

INPUT DD name
Specify the ddname of the input data set or area name to be dumped. The name must appear in the DBD, and a corresponding DD statement must be provided.

22-29

OUTPUT DD name
Specify the ddname of the primary output data set. A corresponding DD statement must be provided.

31-38

COPY DD name
Specify the ddname of the second copy of the dumped data set. This field must be blank if position 2 contains a 1. If present, a corresponding DD statement must be provided.

39

A blank, or the character Y or N
If the compression exit is used, specify Y. If not, Specify N or a blank.

40-47

If position 39 is Y, this position must contain the compression routine name. If position 39 is Y and this position contains all blanks, FABJCMP1 is used as the default. If position 39 is N or a blank, this position is ignored. For more information, see “Compression routines” on page 338.

The following specifications are used only for the HASH Check option. If you do not want to invoke this function, you can place comments in positions 48 - 80; in this case, the character on column 48 must *not* be Y.

48

Blank, the character Y, or any
If you want to invoke the HASH Check option, you must specify Y. If you specify any other character or a blank, positions 48 - 80 are regarded as comment.

49

Character # or any
If you want to evaluate SSP pointers in DEDB, you must specify #.

50-80

Comments can be placed in positions 50 - 80.

Compression routines

IMS HP Image Copy provides four compression exit routines: FABJCMP1, FABJCMP2, FABJCMP3, and FABJCMP4. Specify one of these compression routines to be called by FABJDMPx. If the compression routine name is not specified in the utility control statement (that is, position 39 is Y and position 40-47 is blank), FABJCMP1 is used as the default. The same compression routine is automatically called by FABJRDMx to decompress the compressed data.

FABJCMP1

Runs repeating-characters compression. Free space might also be compressed.

FABJCMP2

Runs free-space compression. The segment data is not compressed.

FABJCMP3

Runs repeating-characters compression of the z/OS® program compression method. Free space might also be compressed.

FABJCMP4

Runs z/OS® program compression of the z/OS®. Both segments and free space are compressed without distinction.

> **Important:** If the database is a DEDB that has SDEP segments, use FABJCMP4. Other compression routines might damage the SDEP segments.

Selecting whether to compress your image copies and which compression routine to use depends on the following factors of your installation:

- The amount of CPU time available
- The compression ratio allowable

Generally, FABJCMP1, FABJCMP3, and FABJCMP4 use more CPU time than FABJCMP2, but FABJCMP3 achieves better compression and uses less CPU time than FABJCMP1. FABJCMP4 uses less CPU time than FABJCMP3, but FABJCMP3 achieves better compression than FABJCMP4.

Multiple-step HASH Check option reference

The multiple-step HASH Check option requires the DBD Analysis program and the HASH Evaluation program to be run.

DBD Analysis program reference

To enable the Multiple-step HASH Check option, you must prepare a DBDEFCTL data set. To prepare this data set, run the HD Pointer Checker DBD Analysis program on all databases whose pointers you want to validate with the HASH Check option.

This program extracts the database definition information from the PSB and the DBD, and writes it into the DBDEFCTL data set, which is used by the Image Copy function with the HASH Check option and the HASH Evaluation program.

The extracted database information is stored in a single member of the DBDEFCTL data set for each database. PSB information is stored as one member. If you specify the member name with the DBDEFCTL keyword, the control information member is created with that name. If the member name is omitted, member name PROCTL01 is used as the default. Do not use a database name as the control information member name.

If the database structure has been changed, you must run the DBD Analysis program to update the database information for all databases to be checked.

Subtopics:

- "Utility control statements" on page 102
- "DD statements" on page 103

Utility control statements

If you have utility control statements in the PROCCTL data set that work well for a stand-alone HD Pointer Checker HASH Check option job, you can use them for the DBD Analysis program input. No change is required.

If you want to code new utility control statements for your DBD Analysis program job, you can apply the syntax described in the *IMS High Performance Pointer Checker User's Guide*.

However, the purpose of this program is to generate the DBDEFCTL data set, which is required by the subsequent run of the Image Copy function with the HASH Check option and HASH Evaluation program steps. Thus, the **HASH=YES** or **HASH=FORCE** parameter is required. If it is not specified, the DBD Analysis program ends with a return code of 8. If none of the specified databases can be checked with the HASH Check option, the DBD Analysis program also ends.

DBDEFCTL=*name*

Optional keyword for the PROC statement in the PROCCTL data set. Specify the PDS member name of the control information. The name is 1- to 8-alphanumeric or national characters ($, #, and @). If you do not specify the name, **PROCTL01** is used as the default member name.

The following table lists the parameters. The values shown in the right column are always used regardless of the specifications in the control statements.

Table 104: Parameters to specify the control information member name

Parameter	Specification
PROC SEP **OPTION** PTRCHK	YES
PROC IXKEYCHK SYMIXCHK SYMLPCHK VLSSUMM EPSCHK CHECKREC **OPTION** HOMECHK INCORE KEYSIN ZEROCTR SPIXCHK SPMN **REPORT** DBDIST CHAINDIST DECODEDBD MAPDBD COMPFACT SEGIO	NO

Parameter	Specification
PROC TYPE	SCAN
PROC CHECK	(CHK,111111)
PROC ITKBSRVR ITKBLOAD	*NO
DATABASE DATASET	REAL
PROC RETCDDSN USER **DATABASE** SCANGROUP BLOCKDUMP **OPTION** NOCHKP VSAMBF DSSIZE ICUNIT IBUFF	The specification is ignored.

DD statements

To run the DBD Analysis program, supply an EXEC statement and the appropriate DD statements that define the input and output data sets.

The following table summarizes the DD statements for the DBD Analysis program.

Table 105: DBD Analysis program DD statements

DDNAME	Use	Format	Need
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMS	Input	PDS	Required
IMS2	Input	PDS	Optional
SYSPRINT	Output	SYSOUT	Optional
SYSUDUMP	Output	SYSOUT	Optional
DFSVSAMP	Input	LRECL=80	Required
DBDEFCTL	Output	PDS	Required
PRIMAPRT	Output	LRECL=133	Required
SNAPPIT	Output	LRECL=133	Optional
PROCCTL	Input	LRECL=80	Required
RECON*x*	Input	KSDS	Optional

STEPLIB DD

This statement points to the HD Pointer Checker load module library data sets. Data sets must be in the following order:

```
//STEPLIB  DD   DISP=SHR,DSN=pgmlib
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

pgmlib is the name of the library that contains the HD Pointer Checker load modules. IMS.SDFSRESL is the name of the library that contains the IMS nucleus and required action modules.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMS DD

This statement defines the library that contains the PSB library and the DBD library. It must contain all DBDs that are referred to by your PSB. If your PSB and DBDs are not in the same library, all appropriate libraries must be concatenated.

IMS2 DD

This statement defines the library that contains the FABPZWTO user exit, the partition selection exit module, or both. The data set must reside on a direct-access volume. It is required if you want to use FABPZWTO, the partition selection exit, or both.

SYSPRINT DD

This statement defines the output messages data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 121.

SYSUDUMP DD

This statement defines the optional output data set that defines the output from a system ABEND dump routine. It is used only when a dump is required. Although this statement is optional, you should include this data set.

DFSVSAMP DD

This statement describes the data set that contains the buffer information required by the DL/I buffer handler.

DBDEFCTL DD

This statement defines the required output partitioned data set to be used as input to the Image Copy function with the HASH Check option and the HASH Evaluation program. This data set contains database definition information for each database as a PDS member named with each DBD name, as well as the information for the HASH Check option process control. The member name of the control information must be specified with the DBDEFCTL parameter of the utility control statement. Do not specify the DCB information on the DD statement. If specified, it is ignored.
Access to the DBDEFCTL data set by an Image Copy job of IMS HP Image Copy and by a HASH evaluation job is restricted to read-only. This data set is reusable until you change the content.

PRIMAPRT DD

This statement defines the output data set that contains the primary reports. It is required. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SNAPPIT DD

This statement defines the output data set that contains the internal control blocks, if DIAG=YES is specified. This statement is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

PROCCTL DD

This statement defines the input control statement data set. The data set can reside on a tape or a direct-access volume; or it can be routed through the input steam (DD * or DD DATA).

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

HASH Evaluation program reference

The HASH Evaluation program is used only by the multiple-step HASH Check option to evaluate the pointers of image copy data sets.

Subtopics:

- "Utility control statements" on page 105

- “DD statements” on page 105

Utility control statements

No utility control statement is needed to run the HASH Evaluation program.

DD statements

To run the HASH Evaluation program, supply an EXEC statement and the appropriate DD statements that define the input and output data sets.

The following table summarizes the DD statements.

Table 106: The HASH Evaluation program DD statements

DDNAME	Use	Format	Need
STEPLIB	Input	PDS	Optional
SYSPRINT	Output	SYSOUT	Required
SYSUDUMP	Output		Optional
DBDEFCTL	Output	PDS	Required
PRIMAPRT	Output	LRECL=133	Optional
EVALUPRT	Output	LRECL=133	Required
SUMMARY	Output	LRECL=133	Optional
SORTIN	Input		Required
HISTORY	Input/Output	KSDS	Optional
IMS	Input	PDS	Required if PGM=DFSRRC00
IMS2	Input	PDS	Optional if PGM=DFSRRC00
DFSRESLIB	Input	PDS	Required if PGM=DFSRRC00
DFSVSAMP	Input		Required if PGM=DFSRRC00
RECON*x*	Input	KSDS	Optional if PGM=DFSRRC00

STEPLIB DD

This statement points to the load module library data set of HD Pointer Checker.

SYSPRINT DD

This statement defines the output messages data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 121.

SYSUDUMP DD

This statement defines the optional output data set that defines the output from a system ABEND dump routine. It is used only when a dump is required. Although this statement is optional, you should include this data set.

DBDEFCTL DD

This statement defines the required input partitioned data set created by a preceding DBD Analysis program job. This data set contains the database definition information for each database as a PDS member named with each DBD name, and the process control information for the HD Pointer Checker HASH Check function. Specify the member name of the process control information with the DSNAME (or DSN) keyword as follows:

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL(member)
```

If the member name is not specified (see the following example), the default member name PROCTL01 is used for the control information.

```
DBDEFCTL DD DISP=SHR,DSN=HPS.DBDEFCTL
```

PRIMAPRT DD

This statement defines the output data set containing the primary reports. It is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

EVALUPRT DD

This statement defines the output data set containing the evaluation reports. It is required. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SUMMARY DD

This statement defines the output data set containing the summary reports. It is optional. If BLOCKSIZE is coded on the DD statement, it must be a multiple of 133.

SORTIN DD

This statement specifies the input HASH record data sets created by the preceding Image Copy function with the HASH Check function jobs. A complete set of the HASH record data sets must be concatenated on the DD statement. Otherwise, the HASH Evaluation program process might not be completed and erroneous pointer error messages might be issued.

IMS DD

This statement defines the library that contains the PSB library and the DBD library. It must contain all DBDs that are referred to by your PSB. If your PSB and DBDs are not in the same library, all appropriate libraries must be concatenated.

IMS2 DD

This statement defines the library that contains the FABPZWTO user exit, the partition selection exit module, or both. The data set must reside on a direct-access volume. It is required if you want to use FABPZWTO, the partition selection exit, or both.

HISTORY DD

This optional data set defines the HISTORY data set (VSAM KSDS) that is used as input to the DB Historical Data Analyzer and Space Monitor of IMS HP Pointer Checker. When the HISTORY option is specified, this data set is required, and must be allocated and initialized by the DB Historical Data Analyzer utility before you run IMS HP Image Copy. DISP=SHR must be used. For more information, see the *IMS High Performance Pointer Checker User's Guide*.

DFSRESLIB DD

This statement points to an authorized library that contains the IMS SVC modules.

DFSVSAMP DD

This statement describes the data set that contains the buffer information required by the DL/I buffer handler.

RECON1 DD

RECON2 DD

RECON3 DD

These statements specify the DBRC RECON data sets. These statements are required if HALDB exists in the databases and the RECON data sets are not allocated dynamically, or if DBRC parameter is Y and the RECON data sets are not allocated dynamically. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

Examples for taking image copies with DFSUDMP0 JCL

The following topics provide examples for running IMS HP Image Copy by using IMS compatible JCL.

Example for IMS compatible JCL

Use this example to run the Image Copy function with IMS compatible JCL.

The following figure shows a sample procedure for DFSUDMP0.

Figure 82: Sample procedure of the Image Copy function

```
//FABJIC  PROC DBRC=YES,                    DBRC PARAMETER
//        HPIO=YES,                         HPIO PARAMETER
//        DBTLIB=''                         HPIC LOAD LIBRARY
//        RESLIB='IMSVS.SDFSRESL',          IMS RESLIB
```

```
//        DBDLIB='IMSVS.DBDLIB',            IMS DBD LIBRARY
//        DEFCTL='',       DEFCTL='DUMMY',  IF NOT USE HDPC HASH
//        DBDEFC='HPS.DBDEFCTL',            INPUT DBDEFCTL DATA SET
//        SORTEX='HPS.SORTEX',              OUTPUT SORTEX
//        PRTBLK=6118,  (133*46)            BLKSIZE OF PRINT DATA SETS
//        U=SYSDA,                          UNIT FOR WORK/OUTPUT D/S
//        CYL='1,1'                         SPACE FOR WORK/OUTPUT D/S
//*-------------------------------------------------------------------*
//ICEHASH  EXEC PGM=DFSUDMP0,PARM='DBRC=&DBRC,HPIO=&HPIO'
//STEPLIB  DD DISP=SHR,DSN=&DBTLIB
//         DD DISP=SHR,DSN=&RESLIB
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//DFSRESLB DD DISP=SHR,DSN=&RESLIB
//IMS      DD DISP=SHR,DSN=&DBDLIB
//SYSPRINT DD SYSOUT=A
//*-------------------------------------------------------------------*
//* FOR HDPC HASH CHECK INPUT
//*-------------------------------------------------------------------*
//DBDEFCTL DD &DEFCTL.DISP=SHR,DSN=&DBDEFC
//*-------------------------------------------------------------------*
//* FOR HASH CHECK OUTPUT
//*-------------------------------------------------------------------*
//SORTEX   DD DISP=(NEW,CATLG),DSN=&SORTEX,
//            UNIT=&U,SPACE=(CYL,(&CYL))
//*-------------------------------------------------------------------*
//* FOR HDPC HASH CHECK REPORTS
//*-------------------------------------------------------------------*
//PRIMAPRT DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//STATIPRT DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//VALIDPRT DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SNAPPIT  DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//*-------------------------------------------------------------------*
//* FOR WORK DATA SETS
//*-------------------------------------------------------------------*
//FSESTAT  DD UNIT=&U,SPACE=(CYL,(&CYL))
//*-------------------------------------------------------------------*
//* FOR DEDB PC HASH CHECK REPORTS
//*-------------------------------------------------------------------*
//MSGOUT   DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//REPORTS  DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//VALIDPRT DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//SNAPDPIT DD SYSOUT=*,DCB=BLKSIZE=&PRTBLK,OUTLIM=0
//*-------------------------------------------------------------------*
//* FOR DEDB PC HASH CHECK WORK DATA SETS
//*-------------------------------------------------------------------*
//SORTIN   DD   UNIT=&U,SPACE=(CYL,(&CYL))
//SORTOUT  DD   UNIT=&U,SPACE=(CYL,(&CYL))
//SORTWK01 DD   UNIT=&U,SPACE=(CYL,(&CYL))
```

Examples for using the compression routines

Use the following examples for dumping database data sets using the compression routine.

Subtopics:

- “Example 1: Dumping a single database data set” on page 344
- “Example 2: Dumping multiple database data sets” on page 345

Example 1: Dumping a single database data set

The following figure is an example of a job to dump a data set with the ddname DBHI3A from a database named DI32DB01. The output data set ddname is DBAOUT1.

Figure 83: JCL example for dumping a single data set with compression

```
//DBDUMP   JOB
//*
//STEP1   EXEC PGM=DFSUDMP0,REGION=0K
//STEPLIB   DD DSNAME=HPS.SHPSLMD0,DISP=SHR
//          DD DSNAME=IMS.SDFSRESL,DISP=SHR
//DFSRESLB  DD DSNAME=IMS.SDFSRESL,DISP=SHR
//IMS       DD DSNAME=IMS.DBDLIB,DISP=SHR
//SYSPRINT  DD SYSOUT=A
```

```
//DBHI3A    DD DSNAME=IMS.DBHI3A,DISP=SHR
//DBAOUT1   DD DSNAME=IMS.DBAOUT1,DISP=(NEW,KEEP),
//             UNIT=TAPE,VOL=SER=DBDMP1,LABEL=(,SL)
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7
//SYSIN     DD *
D1 DI32DB01 DBHI3A   DBAOUT1          Y        DUMP SINGLE DS WITH COMP
```

Example 2: Dumping multiple database data sets

The following figure is an example of a job to dump two data sets with ddnames DBHI3A and DBHI3B from database named DI32DB01. Two copies of the data set DBHI3A are created.

Figure 84: JCL example for dumping multiple data sets with compression

```
//DBDUMP   JOB
//*
//STEP1   EXEC PGM=DFSRRC00,PARM='ULU,DFSUDMP0',REGION=0K
//STEPLIB   DD DSNAME=HPS.SHPSLMD0,DISP=SHR
//          DD DSNAME=IMS.SDFSRESL,DISP=SHR
//DFSRESLB  DD DSNAME=IMS.SDFSRESL,DISP=SHR
//IMS       DD DSNAME=IMS.DBDLIB,DISP=SHR
//SYSPRINT  DD SYSOUT=A
//DBHI3A    DD DSNAME=IMS.DBHI3A,DISP=SHR
//DBHI3B    DD DSNAME=IMS.DBHI3B,DISP=SHR
//DBAOUT1   DD DSNAME=IMS.DBAOUT1,DISP=(NEW,KEEP),
//             UNIT=TAPE,VOL=SER=DBDMP1,LABEL=(,SL)
//DBAOUT2   DD DSNAME=IMS.DBAOUT2,DISP=(NEW,KEEP),
//             UNIT=TAPE,VOL=SER=DBDMP2,LABEL=(,SL)
//DBBOUT1   DD DSNAME=IMS.DBBOUT1,DISP=(NEW,KEEP),
//             UNIT=TAPE,VOL=SER=DBDMP3,LABEL=(,SL)
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7
//SYSIN     DD *
D2 DI32DB01 DBHI3A   DBAOUT1  DBAOUT2 Y        DATA SET 1-DUMP 1+2
D1 DI32DB01 DBHI3B   DBBOUT1          Y        DATA SET 2-DUMP 1
```

Example for using the HP Input/Output interface

Use this example to specify the HPIO keyword in DFSUDMP0 JCL.

DFSUDMP0 is used as an alias for FABJDMP0 and DFSURDB0 is used as an alias for FABJRDB0 to generate image copies or recover a database in a ULU region. If IMS HP Image Copy program DFSUDMP0 is used directly to generate an image copy, you can use HPIO in the parameter starting string for DFSUDMP0.

Figure 85: Using HPIO=Y in the APARM parameter

```
//RCV     JOB USER=&SYSUID,NOTIFY=&SYSUID,
//     MSGCLASS=H,CLASS=A,REGION=nM,TIME=2,MSGLEVEL=(1,1)
//STEP1    EXEC  PGM=DFSUDMP0,PARM='DBRC=N,HPIO=Y',REGION=0K
//STEPLIB  DD DISP=SHR,DSN=IMSTOOL.HPIC.LOADLIB
//         DD DISP=SHR,DSN=IMSBLD.I71RTS2A.CRESLIB
//DFSRESLB DD DISP=SHR,DSN=IMSBLD.I71RTS2A.CRESLIB
//IMS      DD DISP=SHR,DSN=VNDO442.HPIC.DBDLIB
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//P1E    DD DSN=VNDO442.HPIC.P1E,DISP=SHR
//P1EOUT DD DSN=VNDO442.HPIC.P1E1.IC,DISP=(NEW,CATLG),
//          UNIT=SYSDA,VOL=SER=IMSTL5,SPACE=(CYL,(400,20))
//SYSIN DD *
D1 P1E      P1E      P1EOUT           Y          DUMP SINGLE DS WITH COMP
//
```

Examples for enabling the HD Pointer Checker HASH Check option

Use the following examples to enable the HD Pointer Checker HASH Check option for the Image Copy function with IMS compatible JCL.

Subtopics:

- “Example 1: Taking image copies with a single job (multiple-step HASH Check)” on page 346
- “Example 2: Taking image copies with multiple job steps (multiple-step HASH Check)” on page 347
- “Example 3: Taking image copies with single-step HASH Check” on page 348

Example 1: Taking image copies with a single job (multiple-step HASH Check)

The following figure is a JCL example for DBDEFCTL allocation job.

Figure 86: JCL example to allocate DBDEFCTL

```
//ALLOC    JOB
//ALLOC    EXEC PGM=IDCAMS,DYNAMNBR=10
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
 DELETE  (SAMPLE.DBDEFCTL) NONVSAM
 SET MAXCC = 0
 ALLOCATE DSNAME('SAMPLE.DBDEFCTL') -
          NEW                       -
          UNIT(SYSDA)               -
          VOL(HPSVOL)               -
          SPACE(10,10) CYLINDER DIR(50)
/*
```

The following figure is a JCL example for the DBD Analysis program. This sample procedure, FABPDA, is provided in the SHPSSAMP library. The HIDAM database HI00180 has three data set groups, whose DD names are DSG001, DSG002, and DSG003. IX00180 is a HIDAM primary index.

Figure 87: JCL example for DBD Analysis program

```
//DBDANAL  JOB
//DBDANAL  EXEC FABPDA,
//              PSB='PSBL0180',
//              DBDEFC='SAMPLE.DBDEFCTL'
//PROCCTL  DD *
  PROC TYPE=ALL,HASH=YES
  DATABASE DB=HI00180,DD=DSG001
  DATABASE DB=HI00180,DD=DSG002
  DATABASE DB=HI00180,DD=DSG003
  DATABASE DB=IX00180,DD=PINDEX1,PRIMEDB=HI00180
/*
```

The following figure is a JCL example for an Image Copy job of IMS HP Image Copy with the HASH Check option for a HIDAM database and the primary index. This sample procedure, FABJIEC, is provided in the SHPSSAMP library. This job takes the image copies of four database data sets in a single job. The HASH records of the four database data sets are combined into one HASH record data set.

Figure 88: Example of Image Copy JCL (single job)

```
//DBDUMP   JOB
//DBDUMP   EXEC FABJEIC,
//              DBDEFC='SAMPLE.DBDEFCTL',
//              SORTEX='SAMPLE.SORTEX'
//DSG001   DD DISP=OLD,DSN=HI00180.DSG001
//DSG002   DD DISP=OLD,DSN=HI00180.DSG002
//DSG003   DD DISP=OLD,DSN=HI00180.DSG003
//PINDEX1  DD DISP=OLD,DSN=IX00180.PINDEX1
//DBAOUT1  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS1
//DBAOUT2  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS2
//DBAOUT3  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS3
//DBAOUTX  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDSX
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG001   DBAOUT1                  Y HASH CHECK ON
D1 HI00180  DSG002   DBAOUT2                  Y HASH CHECK ON
D1 HI00180  DSG003   DBAOUT3                  Y HASH CHECK ON
D1 IX00180  PINDEX1  DBAOUTX                  Y HASH CHECK ON
/*
```

The following figure is a JCL example for the HASH Evaluation program for a HIDAM database and the primary index.

Figure 89: Example of HASH Evaluation program JCL

```
//HASHEVEL JOB
//*
//HASHEVAL EXEC FABPHE,
//             DBDEFC='SAMPLE.DBDEFCTL',
//             SORTEX='SAMPLE.SORTEX'
```

After you complete the HASH evaluation, delete the SORTEX data set.

Example 2: Taking image copies with multiple job steps (multiple-step HASH Check)

The following figure is an example of multiple Image Copy jobs with the HASH Check option for a HIDAM database and the primary index. This sample procedure, FABPIC, is provided in the SHPSSAMP library.

In this example, the HIDAM database HI00180 has three data set groups, whose DD names are DSG001, DSG002, and DSG003. IX00180 is a HIDAM primary index.

The same DBD Analysis program JCL as used in "Example 1: Taking image copies with a single job (multiple-step HASH Check)" on page 346 can be used for this case. You can use the already created DBDEFCTL data set. The image copies of four database data sets are taken in multiple jobs. The HASH records are written into separate HASH record data sets.

Figure 90: Example of Image Copy JCL (multiple jobs)

```
//DBDUMP1  JOB
//DBDUMP   EXEC FABPIC,
//             DBDEFC='SAMPLE.DBDEFCTL',
//             SORTEX='SAMPLE.SORTEX1'
//DSG001   DD DISP=OLD,DSN=HI00180.DSG001
//DBAOUT1  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS1
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG001   DBAOUT1          Y        DUMP SINGLE DS WITH COMP
/*
//DBDUMP2  JOB
//DBDUMP   EXEC FABPIC,
//             DBDEFC='SAMPLE.DBDEFCTL',
//             SORTEX='SAMPLE.SORTEX2'
//DSG002   DD DISP=OLD,DSN=HI00180.DSG002
//DBAOUT2  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS2
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG002   DBAOUT2          Y        DUMP SINGLE DS WITH COMP
/*

//DBDUMP3  JOB
//DBDUMP   EXEC FABPIC,
//             DBDEFC='SAMPLE.DBDEFCTL',
//             SORTEX='SAMPLE.SORTEX3'
//DSG003   DD DISP=OLD,DSN=HI00180.DSG003
//DBAOUT3  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS3
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HI00180  DSG003   DBAOUT3          Y        DUMP SINGLE DS WITH COMP
/*

//DBDUMPX  JOB
//DBDUMP   EXEC FABPIC,
//             DBDEFC='SAMPLE.DBDEFCTL',
//             SORTEX='SAMPLE.SORTEXX'
//PINDEX1  DD DISP=OLD,DSN=IX00180.PINDEX1
//DBAOUTX  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDSX
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 IX00180  PINDEX1  DBAOUTX                  Y HASH CHECK ON
/*
```

The following figure is an example of a HASH Evaluation program job for a HIDAM database and the primary index. This sample procedure, FABPHE, is provided in the SHPSSAMP library.

Figure 91: Example of HASH Evaluation program JCL with multiple SORTEXs

```
//HASHEVEL JOB
//*
//HASHEVAL EXEC FABPHE,
//              DBDEFC='SAMPLE.DBDEFCTL'
//HDPCPRO.SORTIN   DD DISP=SHR,DSN=DSN=SAMPLE.SORTEX1
//                 DD DISP=SHR,DSN=DSN=SAMPLE.SORTEX2
//                 DD DISP=SHR,DSN=DSN=SAMPLE.SORTEX3
//                 DD DISP=SHR,DSN=DSN=SAMPLE.SORTEXX
```

After you complete the HASH evaluation, delete all SORTEX data sets.

Example 3: Taking image copies with single-step HASH Check

The following figure is an example of an image copy job with single-step HASH Check option for a HIDAM database and the primary index. This sample procedure, FABPICHE, is provided in the SHPSSAMP library.

In this example, the HIDAM database HI00180 has three data set groups, whose DD names are DSG001, DSG002, and DSG003. IX00180 is a HIDAM primary index.

When using the single-step HASH Check option, the DBD analysis and evaluation steps of IMS HP Pointer Checker are not necessary, and all HASH Check processes are done in the IMS HP Image Copy job step.

Figure 92: Example JCL for taking image copies with single-step HASH Check option

```
//DBDUMP EXEC FABPICHE
//DSG001 DD DISP=OLD,DSN=HI00180.DSG001
//DSG002 DD DISP=OLD,DSN=HI00180.DSG002
//DSG003 DD DISP=OLD,DSN=HI00180.DSG003
//PINDEX1 DD DISP=OLD,DSN=IX00180.PINDEX1
//DBAOUT1 DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
// UNIT=SYSDA,VOL=SER=ICVOL1,
// DSN=HI00180.DSG001.ICDS1
//DBAOUT2 DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
// UNIT=SYSDA,VOL=SER=ICVOL1,
// DSN=HI00180.DSG001.ICDS2
//DBAOUT3 DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
// UNIT=SYSDA,VOL=SER=ICVOL1,
// DSN=HI00180.DSG001.ICDS3
//DBAOUTX DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
// UNIT=SYSDA,VOL=SER=ICVOL1,
// DSN=HI00180.DSG001.ICDSX
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN DD *
D1 HI00180  DSG001   DBAOUT1                  Y HASH CHECK ON
D1 HI00180  DSG002   DBAOUT2                  Y HASH CHECK ON
D1 HI00180  DSG003   DBAOUT3                  Y HASH CHECK ON
D1 IX00180  PINDEX1  DBAOUTX                  Y HASH CHECK ON
/*
```

Example for enabling the DEDB HASH Check option

Use the following examples to enable the DEDB HASH Check option for the Image Copy function with IMS compatible JCL.

The following figure is an example of an Image Copy job of IMS HP Image Copy with the HASH Check option for a DEDB. This job takes the image copies of four database data sets and creates a HASH evaluation report. The HASH records of four database data sets are combined into one HASH record data set.

Figure 93: Sample Image Copy JCL of IMS HP Image Copy

```
//DBDUMP   JOB
//DBDUMP   EXEC FABJEIC,
//              DEFCTL='DUMMY,',
//              SORTEX='NULLFILE'
//AREA01   DD DISP=OLD,DSN=HIDEDB1.AREA01.ADS1
//AREA02   DD DISP=OLD,DSN=HIDEDB1.AREA01.ADS1
//AREA03   DD DISP=OLD,DSN=HIDEDB1.AREA01.ADS1
//AROUT1  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS1
//AROUT2  DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
```

```
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS2
//AROUT3   DD DISP=(NEW,CATLG,DELETE),SPACE=(TRK,(5,5)),
//            UNIT=SYSDA,VOL=SER=ICVOL1,
//            DSN=HI00180.DSG001.ICDS3
//* +----1----+----2----+----3----+----4----+----5----+----6----+----7---
//SYSIN     DD *
D1 HIDEDB1  AREA01   AROUT001         Y        Y DUMP SINGLE AREA WITH COMP
D1 HIDEDB1  AREA02   AROUT002         Y        Y DUMP SINGLE AREA WITH COMP
D1 HIDEDB1  AREA03   AROUT003         Y        Y DUMP SINGLE AREA WITH COMP
/*
```

Recovering databases with IMS compatible JCL

The following topics explain how to recover a database data set by using JCL coded for the DFSURDB0 program.

IMS HP Image Copy provides an interface that enables to start IMS HP Image Copy functions with IMS compatible JCL. You can run the Recovery function by using the JCL that is in the same format as JCL for the IMS standard utility.

The following features of IMS HP Image Copy are supported for the Recovery function that is executed with DFSURDB0 JCL. Other IMS HP Image Copy features are not supported.

- Compressed image copy
- Fast Recovery image copy
- Advanced Image Copy Services support

> **Recommendation:** If you want to enable other features of IMS HP Image Copy, consider using the FABJMAIN program to invoke the Recovery function.

Topics:

- “Features for the Recovery function (DFSURDB0 JCL)” on page 349
- “Considerations for the Recovery function (DFSURDB0 JCL)” on page 350
- “Restrictions for the Recovery function (DFSURDB0 JCL)” on page 350
- “Running the Recovery function with DFSURDB0 JCL” on page 350
- “DD statements for the Recovery function (DFSURDB0 JCL)” on page 351
- “Control statements for the Recovery function (DFSURDB0 JCL)” on page 353
- “Examples for recovering databases with DFSURDB0 JCL” on page 356

Features for the Recovery function (DFSURDB0 JCL)

The Recovery function that is invoked by DFSURDB0 JCL supports the features summarized in the following table.

Table 107: Features for the Recovery function (IMS compatible JCL)

Feature	Description	How to enable this feature
Batch image copy	An IMS image copy (batch image copy) is a copy of a database or area that reflects the state of the data at a point when no updates were being made.	Enabled automatically according to the format of input data set
Compressed image copy	A compressed image copy has the format of database records that are compressed by one of the IMS HP Image Copy compression routines. The advantage of this format is that it reduces allocation space for output image copy.	Enabled automatically according to the format of input data set
Fast Recovery image copy	A Fast Recovery image copy helps you recover database data sets quickly, reducing the total recovery time and the time that the database is unavailable.	Enabled automatically according to the format of input data set

Feature	Description	How to enable this feature
Site Default Generation utility	The Site Default Generation utility of IMS HP Image Copy sets default values for controlling IMS HP Image Copy jobs.	"Setting default values (IMS compatible JCL)" on page 357

Considerations for the Recovery function (DFSURDB0 JCL)

The following considerations apply to using the Recovery function with IMS compatible JCL.

- If DBRC=FORCE was specified on the IMSCTRL macro statement during the definition of the IMS system, DBRC is used during the execution of this utility.
- If DBRC=YES was specified on the IMSCTRL macro statement during the definition of the IMS system, DBRC is used during the execution of this utility unless it is overridden by an N specified in the positional parameter for the DBRC on the execute statement.
- If DBRC=NO was specified during the definition of the IMS system, DBRC is not used during the execution of this utility and not used to generate the JCL.
- To run the Recovery function in an IMS-managed ACBs environment, the following requirements must be met:
  - The IMS catalog is registered to the DBRC RECON data sets.
  - If IMS HP Image Copy needs to access control blocks from the IMS catalog, CATALOG=YES and ACBMGMT=CATALOG are specified in the IMS Catalog Definition exit routine (DFS3CDX0).

Restrictions for the Recovery function (DFSURDB0 JCL)

The following restrictions apply to using the Recovery function with IMS compatible JCL.

The following are common restrictions that apply when using the IMS HP Image Copy functions:

- A HALDB requires that DBRC is active; otherwise a copy request is rejected.
- HSAM, GSAM, and MSDB databases are not supported.

The following restrictions apply when you run the Recovery function with IMS compatible JCL:

- The Recovery function can recover only one DBDS in one execution. The function cannot recover multiple DBDSs in one DBD.
- GROUP processing is not supported.

Running the Recovery function with DFSURDB0 JCL

You can run the Recovery function by using the JCL that is written for the DFSURDB0 program.

Procedure

1. In the DFSURDB0 JCL, code the EXEC statement as follows:

```
//       EXEC PGM=DFSRRC00,PARM='UDR,DFSURDB0,dbdname'
```

UDR

This statement specifies a recovery region.

dbdname

This statement is the name of the DBD that includes the data set to be recovered.

The general IMS positional parameters such as the BUF and SPIE can follow the *dbdname*.

For additional parameters that can be used to specify a batch processing region, see *IMS System Definition*.

2. Code the corresponding control statement in the SYSIN data set. See "Control statements for the Recovery function (DFSURDB0 JCL)" on page 353.
3. Code the appropriate DD statements. For a list of DD statements, see "DD statements for the Recovery function (DFSURDB0 JCL)" on page 351.
   The JCL used to run the Recovery function is the same as that of the original Database Recovery utility, except for the STEPLIB DD specification.

   Examples are provided in "Examples for recovering databases with DFSURDB0 JCL" on page 356.
4. Submit the JCL.

DD statements for the Recovery function (DFSURDB0 JCL)

DD statements are used to identify the source of input and the placement of output information. The following DD statements are supported for the Recovery function that is called from IMS compatible JCL.

The following table summarizes the DD statements.

Table 108: DD statements for the DFSURDB0 JCL

DDNAME	Use	Format	Needed
STEPLIB	Input	PDS	Optional
DFSRESLB	Input	PDS	Optional
IMS	Input	PDS	Required (See Note)
SYSPRINT	Output	SYSOUT	Required
SYSIN	Input	LRECL=80	Required
DFSUDUMP	Input		Optional
DFSUCUM	Input		Optional
DFSULOG	Input		Optional
dataset1	Output		Required
DFSVSAMP	Input		Required
SYSABEND or SYSUDUMP	Output		Optional
RECON1	Input/output	KSDS	Optional
RECON2	Input/output	KSDS	Optional
RECON3	Input/output	KSDS	Optional

Note: IMS DD statement is not required when the IMS management ACBs is enabled.

STEPLIB DD

This statement points to two load module library data sets. The data sets must be in the following sequence:

```
//STEPLIB  DD   DISP=SHR,DSN=HPS.SHPSLMD0
//         DD   DISP=SHR,DSN=IMS.SDFSRESL
```

where:

HPS.SHPSLMD0

The name of the library that contains the load modules of IMS HP Image Copy.

IMS.SDFSRESL

The name of the library that contains the IMS nucleus and required action modules.

To enable IMS-managed ACBs, you must include the IMS Tools Generic Exits library in the STEPLIB concatenation.

To use IMS HP Image Copy site default table, you must specify the library that contains the IMS HP Image Copy site default table.

If STEPLIB is unauthorized because it specifies libraries concatenated to IMS.SDFSRESL, you must specify a DFSRESLB DD statement.

DFSRESLB DD

This statement points to an authorized library that contains the IMS SVC modules.

IMS DD

This statement defines the library that contains the DBD describing the database to dump, generally DSNAME=IMS.DBDLIB. The data set must reside on a direct-access volume.
This statement is not required when the IMS management ACBs is enabled.

SYSPRINT DD

This statement defines the output messages data set. The data set can reside on a tape, a direct-access volume, or a printer, or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 121.

SYSIN DD

This statement defines the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input steam (DD * or DD DATA).

DFSUDUMP DD

This statement defines the image copy input data set, if any, to be used for recovery. It can be a data set created by either the Image Copy function of IMS HP Image Copy or the original Image Copy utility. (The original Image Copy utility can be the Batch Database Image Copy utility, the Online Database Image Copy utility, or the HISAM Reorganization Unload utility.) If no image copy or HISAM unload copy input is supplied, this statement must be coded as DD DUMMY.
The ddname of this statement does not have to be DFSUDUMP, but if so, it must also be included in position 22 of the utility control statement. If the USEDBDS or USEAREA keyword is specified on the GENJCL.RECOV command, the DFSUDUMP DD statement generated is DUMMY.

The data set can reside on a tape or a direct-access volume.

The Recovery function allocates the optimized data buffer for OSAM data set if the buffer size parameter is omitted. You can modify the buffer size by specifying BUFNO for the DCB parameter of the DD statement.

DFSUCUM DD

This statement defines the accumulated change input data set. If no accumulated change input is supplied, this statement must be coded as DD DUMMY. The data set can reside on a tape or a direct-access volume.
The Recovery function allocates the optimized data buffer for OSAM data set if the buffer size parameter is omitted. You can modify the buffer size by specifying BUFNO for the DCB parameter of the DD statement.

DFSULOG DD

This statement defines the log change input. If no log changes are to be applied, this statement must be coded as DD DUMMY. The data set can reside on a tape or a direct-access volume.
You can use multiple logs as input by concatenating the data sets. The DD statements must be in the date and time sequence. The DBRC verifies that the log data sets are in chronological order according to their STOP TIME.

The Recovery function allocates the optimized data buffer for OSAM data set if the buffer size parameter is omitted. You can modify the buffer size by specifying BUFNO for the DCB parameter of the DD statement.

***dataset1* DD**

This statement defines the data set to be recovered. The ddname must be the same as the one in the DBD that describes this data set. It must also be in the utility control statement.
For DEDBs, this DD statement defines the area data set of the area to be recovered. The ddname must be the same as the one in the DBD that describes this area. If an area is registered to the DBRC RECON data set, the ddname and dsname must match the names registered to the ADS list of the target area. If an area is not registered to the DBRC RECON data set and the DBRC RECON data set has the NOFORCER attribute, the ddname must be the same as the area name and must be present in the utility control statement.

The Recovery function allocates the optimized data buffer for VSAM and OSAM data set if the buffer size parameter is omitted. For VSAM, you can modify the buffer size by specifying:

- The data set's BUFFERSPACE

- The BUFSP/BUFNO in the AMP parameter of the DD statement for OSAM
- The BUFNO in the DCB parameter of the DD statement

DFSVSAMP DD

This statement describes the data set that contains the buffer information required by the DL/I buffer handler. This DD statement is required:

- If only change accumulation input is used.
- If log input is used.
- For recovering a VSAM ESDS with data from HISAM unload for the input.
- For recovery when a null image copy data set is used for input.

For more information about the control statement format and the buffer pool structure, see *IMS System Definition*.

The data set can reside on a tape or a direct-access device, or it can be routed through the input stream (DD * or DD DATA).

SYSABEND DD

SYSUDUMP DD

These statements define a dump data set. If both statements are present, the last occurrence is used for the dump.

RECON1 DD

RECON2 DD

RECON3 DD

These statements define the DBRC RECON data sets. These RECON data sets must be the RECON data sets used by the control region. Do not specify these RECON data set DD statements if you want RECON data sets allocated dynamically using the DFSMDA macro.

Control statements for the Recovery function (DFSURDB0 JCL)

The control statements for the Recovery function that is invoked with IMS compatible JCL must reside in the SYSIN data set.

The utility control statement for the Recovery function invoked with IMS compatible JCL is the same as that of the original Recovery function.

ABEND statement

```
 1   5
ABEND
```

Use the ABEND statement to end the utility with a user abend 302 when an abnormal condition is encountered. A storage dump is provided if a SYSUDUMP DD statement is supplied. If this statement is omitted, the Recovery function issues an error message for any abnormal condition encountered and continues processing.

The ABEND control statement must come before the IMS HP Image Copy Database Recovery control statement.

ABEND must start in column 1.

Database Recovery control statement

```
 1   4         13         22         31                          55
S   dbdname   oddname    inddname   time-stamp
```

Position
Description

1

Statement ID
Specify the statement ID of the Database Recovery utility control statement. It must be the character 'S'.

2

Must be blank.

3

Must be blank.

4-11

DBD name
Specify the name of the DBD that describes the database containing the data set to be recovered. This name must also appear in the PARM field of the EXEC statement.

12

Must be blank.

13-20

The data set name
Specify the ddname of the data set to be recovered. It must be the same as the ddname in the DBD and *dataset1* DD statement.

21

Must be blank.

22-29

The input ddname
Specify the ddname of the data set used for the image copy input. If this field is blank, the ddname 'DFSUDUMP' is the default.

30

Must be blank.

31-55

Specify the time stamp when the RCVTIME parameter is specified in the GENJCL.RECOV command. Otherwise, these positions must be blank. For more information about time stamp recovery, see "Time stamp recovery" on page 355.
Either..

31-42

Specifies the date and time in the format *yydddhhmmsst*,
where:

yy is the year.
ddd is the day of the year.
hh is the hour.
mm is the minute.
ss is the second.
t is the tenth of a second.

43

Specifies the sign of the offset value; + or -.

44-47

Specifies the offset to the UTC, in the format HHMM.

48-55

Contains blank.

Or..

31-47

Specifies the punctuated time stamp with the format *yy.ddd hh:mm:ss.t*,
where:

yy is the year.
ddd is the day of the year.
hh is the hour.
mm is the minute.
ss is the second.
t is the tenth of a second.

48

Specifies the sign of the offset value; + or -.

49-53

Specifies the offset to the UTC, in the format HH:MM.

54-55

Contains blanks.

Or..

31-49

Specifies the punctuated time stamp with a four-year digit in the format *yyyy.ddd hh:mm:ss.t*, where:
yy is the year.
ddd is the day of the year.
hh is the hour.
mm is the minute.
ss is the second.
t is the tenth of a second.

50

Specifies the sign of the offset value; + or -.

51-55

Specifies the offset to the UTC, in the format *HHMM*.

56

Contains a blank

57

C if the USEDBDS parameter is specified on the GENJCL.RECOV command; otherwise, blank.

58-80

A comment
For more information, see the GENJCL.JCL command in *IMS Commands* for the version of IMS that you are using.

You do not have to specify the name of the compression routine in the Database Recovery control statement. The image copy header includes the module name and its assemble time stamp.

Time stamp recovery

To recover data sets to a specific point in time, you must provide a valid recovery time stamp in columns 31-55. A valid recovery time stamp can be:

- If the image copy data sets that you use as input are created as batch, SMSNOCIC, or SMSOFFLC image copies, the recovery time stamp can be the time when the Image Copy job was run or any time after that.
- If the image copy data sets that you use as input are created as CIC, SMSCIC, SMSONLC, or ONLINE image copies, the recovery time stamp must be a time after the Image Copy job was run.

To recover data sets to a specific point in time, the following conditions must be satisfied:

- The job must run with DBRC=Y.
- Input image copy data sets, log data sets, and change accumulation data sets must be registered to DBRC RECON data sets.
- The recovery time stamp that you specify must meet the following conditions:
  - Database data sets were not allocated or in use at the specified recovery time stamp.
  - The online log data set (OLDS) must be closed at the specified recovery time stamp, and is archived to the SLDS (system log data set) or RLDS (recovery log data set) before the specified recovery time stamp.
  - If a change accumulation data set is used, the change accumulation data set must be created before the specified recovery time stamp.

Examples for recovering databases with DFSURDB0 JCL

Use the following example for running the Recovery function with IMS compatible JCL.

The following figure shows a sample procedure for DFSURDB0.

Figure 94: Sample procedure of the Recovery function

```
//        PROC DBTLIB='HPS.SHPSLMD0',       HPIC LOAD LIBRARY
//        RESLIB='IMSVS.SDFSRESL',          IMS RESLIB
//        DBDLIB='IMSVS.DBDLIB',            IMS DBD LIBRARY
//        RECON='IMSVS.RECON'              RECON DATA SET
//*-------------------------------------------------------------------*
//         EXEC PGM=DFSRRC00,PARM='UDR,DFSURDB0,DD32DB01'
//STEPLIB  DD DISP=SHR,DSN=&DBTLIB
//         DD DISP=SHR,DSN=&RESLIB
//*-------------------------------------------------------------------*
//* FOR IMS DATA SETS
//*-------------------------------------------------------------------*
//DFSRESLB DD DISP=SHR,DSN=&RESLIB
//IMS      DD DISP=SHR,DSN=&DBDLIB
//SYSPRINT DD SYSOUT=A
//DFSULOG   DD DUMMYVOL=SER=LOG1,LABEL=(,SL)
//RECON1    DD DSNAME=&RECON.1,DISP=SHR
//RECON2    DD DSNAME=&RECON.2,DISP=SHR
//RECON3    DD DSNAME=&RECON.3,DISP=SHR
```

IMS HP Image Copy outputs (IMS compatible JCL)

The following topics describe reports and messages that are issued by IMS HP Image Copy when an IMS HP Image Copy job is started with IMS compatible JCL.

Topics:

- "Output reference (IMS compatible JCL)" on page 356
- "Processing messages for the Image Copy function (IMS compatible JCL)" on page 356
- "Processing messages for the Recovery function (IMS compatible JCL)" on page 357
- "Reports by HASH Check process (IMS compatible JCL)" on page 357

Output reference (IMS compatible JCL)

IMS HP Image Copy job invoked by IMS compatible JCL generates reports and messages.

The following table summarizes outputs generated when an IMS HP Image Copy function is invoked by IMS compatible JCL.

Table 109: Messages generated by IMS HP Image Copy when invoked by IMS compatible JCL

Messages	Output data set	Content	Issued by Image Copy function	Issued by Recovery function
Processing messages for the Image Copy function	SYSPRINT	Processing messages for the Image Copy function include processing messages that were issued during the image copy process	Yes	-
Processing messages for the Recovery function	SYSPRINT	The processing messages for the Recovery function include processing messages that are issued during the recovery process.	-	Yes

Processing messages for the Image Copy function (IMS compatible JCL)

Processing messages for the Image Copy function are generated in the SYSPRINT data set.

The following figure is an example of SYSPRINT messages of the Image Copy function run by IMS compatible JCL.

```
      S Y S I N   C O N T R O L   C A R D
D1 DBHDAM30 HDAMDD30 FABJ1006         YFABJCMP3Y
      E N D   O F   S Y S I N   C O N T R O L   C A R D
DFS391I    **COPY DATA BASE DBHDAM30 DDNAME HDAMDD30
FABJ9007I  COMPRESSED BY EXITNM = FABJCMP3 COMPRESSED COUNT = 00000000100 COMPRESS RATIO = 03.3 %
DFS2803I   RECORD COUNT = 000000101 FOR DDNAME HDAMDD30
           COPY 1 ON VOLUME(S) - ICSMS1
DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED

DFS339I    FUNCTION IM HAS COMPLETED NORMALLY RC=00
```

Figure 95: SYSPRINT messages from the Image Copy function (IMS compatible JCL)

Processing messages for the Recovery function (IMS compatible JCL)

Processing messages for the Recovery function are generated in the SYSPRINT data set.

The following figure is an example of SYSPRINT messages of the Recovery function run by IMS compatible JCL.

```
DFS391I    D A T A   B A S E   D A T A   S E T   R E C O V E R Y   U T I L I T Y


       S Y S I N   C O N T R O L   C A R D S

S   DH41M502 DH41M502
       E N D   O F   S Y S I N   C O N T R O L   C A R D S

DFS391I    **RECOVER DATA BASE DH41M502 DDNAME DH41M502

DFS324W    FUNCTION RV WAS NOT SUPPLIED AN INPUT LOG FILE

DFS2803I   RECORD COUNT = 000001596 FOR DDNAME DFSUDUMP

DFS2803I   RECORD COUNT = 000001061 FOR DDNAME DFSUCUM

DFS2803I   RECORD COUNT = 000000000 FOR DDNAME DFSULOG

DSP0021I  RECON DATA SETS SUCCESSFULLY UPDATED


DFS339I    FUNCTION RV HAS COMPLETED NORMALLY RC=00
```

Figure 96: SYSPRINT messages from the Recovery function (IMS compatible JCL)

Reports by HASH Check process (IMS compatible JCL)

The full-function database HASH Check option generates the STATIPRT Database Statistics report and the STATIPRT HD Data Set Statistics report.

These reports are unique to the full-function database HASH Check option. These reports are in the same format as the reports generated by HD Pointer Checker. For details, see the *IMS High Performance Pointer Checker User's Guide*.

Setting default values (IMS compatible JCL)

You can use the IMS HP Image Copy Site Default Generation utility to set default values for the control statements that are applied when you run IMS HP Image Copy functions with IMS compatible JCL.

The Site Default Generation utility creates a user site default table that can be used when you run IMS HP Image Copy functions with IMS compatible JCL. All the control statement parameter values that are set in the user site default table are applied to IMS HP Image Copy jobs run with IMS compatible JCL.

The Site Default Generation utility analyzes the control statements and generates source code for the site default table.

To have the control statement parameters applied to IMS compatible JCL jobs, the library that contains the site default table module (FABJGLI0) must be concatenated to the STEPLIB DD of IMS compatible JCL. When IMS HP Image Copy finds FABJGLI0 in the STEPLIB concatenation, IMS HP Image Copy loads and uses the table.

The control statement parameter values that are set in the table are applied to IMS HP Image Copy jobs at run time.

If you want to override the values that are set in the site default table, you can do so by specifying relevant values on the EXEC PARM statement or coding relevant control statements in the SYSIN data set of the IMS compatible JCL.

Topics:

- "Specifying site default values for IMS compatible JCL" on page 358
- "DD statements for the Site Default Generation utility (IMS compatible JCL)" on page 360
- "Control statements for the Site Default Generation utility (IMS compatible JCL)" on page 361

Specifying site default values for IMS compatible JCL

To specify site default values for your environment, you must create source code for the site default table by using the FABJTGEN program. Then, assemble and link-edit the source code.

Procedure

1. Prepare JCL for the IMS HP Image Copy Site Default Generation utility (FABJTGEN). Sample JCL that runs the FABJTGEN program is provided in the SHPSSAMP data set. The member name is FABJDFLX. Use the sample or prepare similar JCL of your own.
   To prepare JCL of your own, code the JCL statements as follows:
   a. Code the EXEC statement. The EXEC statement must be in the following form:

      ```
      // EXEC PGM=FABJTGEN,REGION=nM
      ```

   b. Supply the appropriate DD statements.

   For FABJTGEN DD statements, see "DD statements for the Site Default Generation utility (IMS compatible JCL)" on page 360.
2. In the ICEIN data set, code a TABLGEN statement and a GLOBAL statement.

   > **Important:** To generate a site default table for IMS compatible JCL, you must provide a TABLEGEN statement in the ICEIN data set. If a TABLEGEN statement is not provided, the Site Default Generation utility generates a site default table for the FABJMAIN program.

   On the GLOBAL statement, code the control statement keywords and their parameters of which you want to change its default value. For control statements and their parameters, see "Control statements for the Site Default Generation utility (IMS compatible JCL)" on page 361.
3. Run the Site Default Generation utility job step to create source code for the site default table (FABJGLI0).
   The FABJDFLX sample JCL creates source code, and then assembles and link-edits the source code. If you use the FABJDFLX sample, you can skip step "4" on page 358.
4. Assemble and link-edit the FABJGLI0 source code.
   To create the site default table module FABJGLI0, assemble and link-edit the SYSPUNCH that is generated by the FABJTGEN program.

   For SYSIN of the assemble job step, specify the SYSPUNCH data set that is generated by the FABJTGEN program.

   Both the module name and the entry name of the site default table must be FABJGLI0. Link-edit the site default table module with the following options:
   - AMODE=24
   - RMODE=24
   - REUSE
5. Concatenate the load module library in which FABJGLI0 resides to the STEPLIB of IMS compatible JCL.

When IMS HP Image Copy finds FABJGLI0 in the STEPLIB concatenation, IMS HP Image Copy loads and uses the table. The control statement parameter values that are set in the table are applied to the IMS HP Image Copy job at run time.

The following figure shows the FABJDFLX sample for creating the FABJGLI0 source code and assembling and link-editing the source code.

Figure 97: Sample JCL: FABJDFLX (Part 1 of 2)

```
//FABJDFLX JOB
//*--------------------------------------------------------------------*
//*  This JCL consists of following three steps                        *
//*  1.  Generating source code of your site default definition.       *
//*  2.  Assemble source code of your site default table.              *
//*  3.  Link-Edit your site default table module.                     *
//*                                                                    *
//*--------------------------------------------------------------------*
//*  Make the following global changes for this job:                   *
//*                                                                    *
//*    1. The JOB statement should be modified to suit your            *
//*       environment.                                                 *
//*                                                                    *
//*    2. Substitute your dsname where the site default module         *
//*       is mad for the string "$site_def_lib".                       *
//*       'CHANGE $site_def_lib your_site_def_lib_name ALL'            *
//*                                                                    *
//*    3. Substitute your dsname High Level Qualifier (HLQ) for IMS    *
//*       HP Image Copy data sets for the string                       *
//*       "$hpichlq".                                                  *
//*       'CHANGE $hpichlq.SHPS your_hlq.SHPS ALL'                     *
//*     6. Substitute your group-name or unit number for UNIT          *
//*        parameters for the group-name "SYSALLDA", if applicable.    *
//*        'CHANGE SYSALLDA your_sysda ALL'                            *
//*--------------------------------------------------------------------*
//*
//  SET HPICLIB=$hpichlq.SHPSLMD0
//  SET LIBNAME=$site_def_lib
//*                                                                    *
```

Figure 98: Sample JCL: FABJDFLX (Part 2 of 2)

```
//*--------------------------------------------------------------------*
//*   FABGTGEN Process  - Generate Table Source for IMS Compatible JCL*
//*--------------------------------------------------------------------*
//TGEN     PROC
//GEN      EXEC PGM=FABJTGEN,REGION=0M
//*
//STEPLIB   DD  DISP=SHR,
//              DSN=&HPICLIB
//*
//SYSPRINT  DD  SYSOUT=*
//SYSPUNCH  DD  DISP=(NEW,PASS,DELETE),
//              DCB=(RECFM=FB,BLKSIZE=800),
//              SPACE=(TRK,(1,1)),
//              DSN=&&SOURCE,
//              UNIT=SYSALLDA
//SYSUDUMP  DD  DUMMY
//*
//ASM      EXEC PGM=ASMA90,COND=(4,LT,GEN),
//           PARM='OBJECT,NODECK,LIST,XREF(SHORT)'
//SYSLIB    DD  DISP=SHR,
//              DSN=SYS1.MACLIB
//SYSLIN    DD  DISP=(,PASS),
//              SPACE=(CYL,(5,5,0)),
//              DCB=(BLKSIZE=400),
//              DSN=&&OBJECT,
//              UNIT=SYSALLDA
//SYSUT1    DD  UNIT=SYSALLDA,
//              DISP=(,DELETE),SPACE=(CYL,(10,5))
//SYSPUNCH  DD  DUMMY
//SYSPRINT  DD  SYSOUT=*
//SYSIN     DD  DISP=(OLD,DELETE,DELETE),
//              DSN=&&SOURCE
//*
//L       EXEC PGM=IEWL,COND=(4,LT,ASM),REGION=4096K,
//           PARM='LIST,REFR,REUS,AMODE=24,RMODE=24'
//SYSPRINT DD SYSOUT=*
```

```
//SYSLIN   DD DSN=&OBJECT,
//            DISP=(OLD,DELETE,DELETE)
//*
//         PEND
//*
//GO       EXEC TGEN
//*
//GEN.ICEIN DD *
*-----------------------------------------*
*       YOUR SITE DEFAULT DEFINITION      *
*-----------------------------------------*
  TABLEGEN   TYPE=IMSJCL
  GLOBAL     COMP=Y,
             COMPRTN=FABJCMP2,
             HDPC=Y,
             DEDBPC=S,
*
             HPIO=Y,
             COMPMODE=COND,
*
             DBBUF=120,
             DSBUF=20,
             ICBUF=20
/*
//L.SYSLMOD DD DISP=SHR,
//             DSN=&LIBNAME(FABJGLI0)
//*
//
```

DD statements for the Site Default Generation utility (IMS compatible JCL)

The Site Default Generation utility requires DD statements to identify the source of input and the placement of output information.

The following table lists the DD statements that you can specify in the FABJTGEN JCL.

Table 110: DD statements for the Site Default Generation utility for IMS compatible JCL

DDNAME	Use	Format	Required or optional
STEPLIB	Input	PDS	Optional
ICEIN	Input	LRECL=80	Required
SYSPUNCH	Output	LRECL=80	Required
SYSPRINT	Output	LRECL=133	Required
SYSABEND or SYSUDUMP	Output	LRECL=133	Optional

STEPLIB DD

Points to the load module library data set that contains the IMS HP Image Copy load modules.

ICEIN DD

Required. Specifies the input control statement data set. The data set can reside on a tape or a direct-access volume, or it can be routed through the input stream (DD * or DD DATA).

SYSPUNCH DD

Required. Specifies the output data set. The data set contains assembler source code generated by the FABJTGEN program. The following DCB parameters must be specified:

- RECFM=F or FB
- LRECL=80
- BLKSIZE=80 or multiple of 80

SYSPRINT DD

Required. Defines the output message data set. The data set can reside on a tape, a direct-access volume, or a printer; or it can be routed through the output stream (SYSOUT). SYSPRINT can be blocked but must be a multiple of 133.

SYSABEND DD

SYSUDUMP DD

Defines the dump data set. These DD statements are optional. If both statements are present, the last occurrence is used for the dump.

Control statements for the Site Default Generation utility (IMS compatible JCL)

The ICEIN data set contains your description of the site default values. ICEIN is a mandatory input data set.

This control data set usually resides in the input stream. However, it can also be defined as a member of a sequentially partitioned data set. The length of the ICEIN data set must be fixed at 80 bytes. BLKSIZE, if specified, must be a multiple of 80.

In the ICEIN data set, you must code a TABLEGEN statement and a GLOBAL statement.

TABLEGEN statement (IMS compatible JCL)

TABLEGEN statement defines the type of the site default table. TABLEGEN statement must be placed as the first statement in the ICEIN data set.

TABLEGEN statement is a required statement. Only one TABLEGEN statement can be specified.

Specify the TABLEGEN statement as follows:

```
TABLEGEN TYPE=IMSJCL
```

Important: If you do not provide a TABLEGEN statement in the ICEIN data set, the Site Default Generation utility generates a site default table for the FABJMAIN program. To generate a site default table for IMS compatible JCL, you must code the TABLEGEN statement.

GLOBAL statement (IMS compatible JCL)

GLOBAL statement defines the site default values that are applied to IMS HP Image Copy processes when these processes are started by IMS compatible JCL.

GLOBAL statement is a required statement. Only one GLOBAL statement can be specified.

The following control keywords can be specified for the GLOBAL statement:

- “COMP keyword” on page 362
- “COMPMODE keyword” on page 363
- “COMPRTN keyword” on page 363
- “DBBUF keyword” on page 364
- “DEDBPC keyword” on page 364
- “DSBUF keyword” on page 365
- “HDPC keyword” on page 365
- “HPIO keyword” on page 365
- “ICBUF keyword” on page 366

Control statement syntax

Follow these coding conventions to code GLOBAL statement keywords for the FABJTGEN program:

- A GLOBAL statement consists of a control statement name (GLOBAL) and one or more process option parameters. An option parameter consists of a keyword and an operand. The syntax is as follows:

  ```
  Control-Statement blank option-parameter,option-parameter,...
  ```

For example, the GLOBAL statement in ICEIN data set can be coded as follows:

```
//ICEIN    DD *
  TABLEGEN TYPE=IMSJCL
*
  GLOBAL   HPIO=Y,
           COMP=Y,COMPRTN=FABJCMP2
/*
```

- Only one GLOBAL statement can be specified in the ICEIN data set.
- GLOBAL statement and its option parameters must be coded in columns 2 - 72.
- Control statement name (GLOBAL) must be separated from the first option parameter by one or more blanks.
- Control statement name (GLOBAL) and the first option parameter must be written on the same line.
- When more than one option parameter is specified, they must be separated by a comma (,) and no blanks are allowed between these option parameters.
- Option parameters can be continued to the next control statement line. On the continued line, option parameters can start from column 2.
- The GLOBAL statement must start with a control statement name (GLOBAL) and end with a comma after the option parameter.
- An option parameter is constructed with a keyword and its operand associated value, separated by an equal sign (=). No blanks are allowed before or after the equal sign (=).
- If two or more values are needed to specify the keyword, the set of values must begin with a parenthesis '(' and end with a parenthesis ')'. The values must be separated by a comma.
- A comment must begin with an asterisk (*) in column 1. Or comments can follow the last option parameter on each control statement line, separated by at least one blank.
- GLOBAL statement can contain uppercase alphabetic characters, numeric characters, and the following special characters:
  - Asterisk (*)
  - Comma (,)
  - Equal sign (=)
  - Parenthesis ( )
  - Forward slash (/)

COMP keyword

The COMP keyword specifies whether the Image Copy function compresses output image copy data.

This keyword sets the default value for column 39 of SYSIN data set. The system default value is COMP=N, which means output image copy data is not compressed.

Related keywords

- COMPMODE keyword
- COMPRTN keyword

Format

```
COMP=Y|N
```

Y

Compresses output image copy data.

N

Does not compress output image copy data.

COMPMODE keyword

The COMPMODE keyword controls the priority of the compression methods for compressing output image copy data sets. This keyword is effective only when the IDRC feature is activated by the JCL or the system.

This keyword sets the default value for the COMPMODE keyword in EXEC PARM. The system default value is COMPMODE=N, which means when the compression routine is not FABJCMP2, IMS HP Image Copy automatically turns off the software compression and uses IDRC.

The compression methods are determined based on the specifications of the COMP keyword and the COMPRTN keyword. The following table summarizes the IMS HP Image Copy compression features that are applied by each combination of the COMPMODE, COMP, and COMPRTN specifications.

Table 111: Compression features applied by the combination of compression keywords

COMPMODE=	COMP=	COMPRTN=	Applied compression feature
N	N	N/A	IDRC compression
N	Y	FABJCMP2	Software compression and IDRC compression
N	Y	FABJCMP1, FABJCMP3, or FABJCMP4	IDRC compression
COND	N	N/A	IDRC compression
COND	Y	FABJCMP2	Software compression and IDRC compression
COND	Y	FABJCMP1, FABJCMP3, or FABJCMP4	Software compression

Whether the IDRC feature is activated depends on the z/OS® system definition and on the TRTCH subparameter of the DCB parameter for the output image copy data set DD statement.

If the IDRC feature is activated for the primary image copy data set, the compression routine is ignored for other image copies that are taken from the same database data set.

Related keywords

- COMP keyword
- COMPRTN keyword

Format

```
COMPMODE=COND|N
```

COND

If the IDRC feature is active and the compression routine is not FABJCMP2, IMS HP Image Copy automatically turns off IDRC and uses software compression.

N

If the IDRC feature is active and the compression routine is not FABJCMP2, IMS HP Image Copy automatically turns off the software compression and uses IDRC.

COMPRTN keyword

The COMPRTN keyword specifies the name of the compression routine that the Image Copy function invokes to compress output image copy data.

This keyword is effective when COMP=Y is specified.

This keyword sets the default value for column 40 of SYSIN data set. The system default value is COMPRTN=FABJCMP1, which means the Image Copy function uses compression routine FABJCMP1 to compress output image copy data.

Related keywords

- COMP keyword

- COMPMODE keyword

Format

```
COMPRTN=routine
```

routine

The name of the compression routine. IMS HP Image Copy provides four compression exit routines: FABJCMP1, FABJCMP2, FABJCMP3, and FABJCMP4.
Specify one of these compression routines. If the COMP=Y keyword is specified without the COMPRTN keyword, FABJCMP1 is used as the default. The same compression routine is automatically called in Recovery function jobs to decompress the compressed data. IMS HP Image Copy provides the compression routines that are shown in the following table.

Table 112: Compression routines of IMS HP Image Copy

Compression routine	Compression algorithm
FABJCMP1	Runs repeated character compression. Free space can also be compressed.
FABJCMP2	Runs only free space compression. Segmented data is not compressed.
FABJCMP3	Runs repeating-characters compression of the z/OS® program compression method. Free space might also be compressed.
FABJCMP4	Runs the repeating-characters compression of the z/OS® program compression method. This routine runs the block compression, which does not distinguish between the data portion, free space, and unused space in the database.

Consideration: If the IDRC feature is installed and is active on the native tape drive, software compression is suppressed for the IC1, IC2, or both output data sets except when FABJCMP2 is used.

Tip: If you want to use software compression for the tape device on which the IDRC feature is active, specify the COMPMODE keyword to deactivate IDRC.

DBBUF keyword

The DBBUF keyword specifies the number of buffers to be used for accessing the database data set groups or areas.

This keyword sets the default value for the BUFND parameter (for OSAM data sets) or the AMP parameter (for VSAM data sets) that you specify on the *datain* DD statement. With system's default, IMS HP Image Copy uses the optimized value that is based on the record size or the CI size of the database data sets.

Format

```
DBBUF=nnnnn
```

nnnnn

The left-aligned number of buffers used to access database data set groups or areas.

If you specify HPIO=Y, the DBBUF keyword is ignored for OSAM and VSAM ESDS data sets of the database.

DEDBPC keyword

The DEDBPC keyword specifies whether to invoke HASH Check of the DEDB Pointer Checker utility during the execution of the Image Copy function.

This keyword is effective when the executing function is batch image copy or concurrent image copy.

This keyword sets the default value for columns 48 and 49 of SYSIN data set. The system default value is DEDBPC=N, which means DEDB HASH pointer check is not invoked.

Format

```
DEDBPC=Y|S|N
```

Y

Invokes DEDB HASH pointer check.

S

Invokes DEDB HASH pointer check and evaluates SSP pointers in the DEDB.

N

Does not invoke DEDB HASH pointer check.

DSBUF keyword

The DSBUF keyword specifies how many buffers are to be used in getting access to the input data set in the Recovery function.

This keyword sets the default value for the BUFND parameter that you specify on the DD statements for the input image copy data set, DFSULOG, and DFSUCUM. The system default value is DSBUF=50, which means 50 buffers are used.

Format

```
DSBUF=nnnn
```

nnnn

The left-aligned number of buffers used in getting access to the input image copy data set, the log data set, and the change accumulation data set.

HDPC keyword

The HDPC keyword specifies whether to invoke pointer checking of the HD Pointer Checker utility during the execution of the Image Copy function.

This keyword is effective when the executing function is batch image copy.

This keyword sets the default value for column 48 of SYSIN data set. The system default value is HDPC=N, which means HD Pointer Checker is not invoked.

Format

```
HDPC=Y|N
```

Y

Invokes HD Pointer Checker HASH pointer check.
If HDPC=Y is specified for a database that is not supported by HD Pointer Checker HASH Check, an image copy of the database is created but pointer checking is not done.

N

Does not invoke HD Pointer Checker HASH pointer check.

Consideration

HD Pointer Checker HASH pointer check is not supported in the following cases:

- Concurrent image copy process
- Target database is a HALDB and IMS HP Image Copy is scheduled with PGM=DFSRRC00.

HPIO keyword

The HPIO keyword specifies whether to use the HP Input/Output interface to access input database data sets in the Image Copy function.

This keyword sets the default value for the HPIO keyword on EXEC PARM. The system default value is HPIO=N, which means the HP Input/Output interface is not used.

Format

```
HPIO=Y|N
```

Y

Specifies to use the HP Input/Output method.
HP Input/Output method is a high performance I/O method that is used by IMS Tools products to access input database data sets. This method can be used when the database data sets are OSAM or VSAM ESDS data sets.

This keyword is ignored when either or both of the following conditions apply:

- IMS HP Image Copy is run by EXEC PGM=DFSRRC00.
- The input database data set is a VSAM KSDS data set.

To specify HPIO=Y, all the load libraries of IMS HP Image Copy and the site default module must be APF authorized.

N

Specifies that standard management methods are used to read database data sets and area data sets.

ICBUF keyword

The ICBUF keyword specifies the number of buffers to be used for accessing output image copy data set.

This keyword sets the default value for the BUFND parameter that you specify on the *dataout* DD statements. The system default value is ICBUF=50, which means 50 buffers are used.

Format

```
ICBUF=nnnn
```

nnnn

The left-aligned number of buffers used to access the output image copy data set.

Creating image copies in other IMS Tools product jobs

The Image Copy function of IMS HP Image Copy works as an integrated auxiliary function for other IMS Tools products. If you use one of the following products, you can invoke the image copy process of the Image Copy function within the IMS Tools product job and create image copies.

Topics:

- "IMS Database Recovery Facility" on page 367
- "IMS Database Reorganization Expert" on page 370
- "IMS HP Fast Path Utilities" on page 374
- "IMS Online Reorganization Facility" on page 377
- "IMS HALDB Toolkit" on page 383

IMS Database Recovery Facility

The Image Copy function integrates with IMS Database Recovery Facility and creates image copies while the IMS Database Recovery Facility job is running.

If you request the image copy process in the recovery job of IMS Database Recovery Facility, the Image Copy function starts and creates the following image copies:

- Image copy data sets of recovered database data sets.
- Incremental Image Copy (ICR) where a new image copy is created from an image copy, a log, and/or a change accumulation input data sets for every database data set in the recovery list that uses the recovery process. Actual database recovery is not done and the databases are not accessed.

Supported image copy features

The following table summarizes the image copy features that are supported for IMS Database Recovery Facility.

Table 113: Image copy features for IMS Recovery Solution Pack: IMS Database Recovery Facility

Feature		**Feature is supported?**
Format of output image copy data set	Batch image copy	Yes
	Compressed image copy	Yes
	Fast Recovery image copy	-
Data access method	Advanced Image Copy Services support	-
	High Performance Input/Output interface	-
	OS access method	-
Processing type	Parallel processing	Yes
	Dynamic allocation of output image copy data sets Note 1	Yes
	Batch image copy and concurrent image copy	Batch/CIC Note 2
Processing option	Stacking output image copies	Yes
	Checkpoint Restart	-
	Creating multiple image copies at one time (maximum number of image copies)	Yes (2)
	Virtual image copy process	Yes
Processing option control	Site default table	Yes
IMS command interface	Integration with IMS Tools Online System Interface	-

Feature		Feature is supported?
IMS Tools KB support	Central management of reports	-

Notes:

1. The naming rule for the image copy data set that IMS HP Image Copy dynamically allocates conforms to the data set naming template. For more information, see "Data set naming template" on page 283.
2. CIC can be scheduled by the incremental image copy function of IMS Database Recovery Facility. IMS Database Recovery Facility determines the process type automatically.

How to request and control the image copy process

- The IC() keyword on the ADD command indicates that an image copy is to be created for each recovered database.
- The OUTPUT(ICR) keyword indicates that an incremental image copy is created using the prior image copy and archived logs or change accumulation data sets as input.

Control statements for the image copy process are read from the following resources:

- UTILGBL control statement of IMS Database Recovery Facility JCL stream
- IC keyword parameter of the ADD command of IMS Database Recovery Facility JCL stream
- IMS HP Image Copy site default table, if the site default module is found in the STEPLIB concatenation

If you want to add keywords or replace the default keyword values for controlling the image copy process, specify the values in one of these resources. ICEIN DD statement is not supported.

For information about invoking the Image Copy function in IMS Database Recovery Facility jobs, see the *IMS Recovery Solution Pack IMS Database Recovery Facility User's Guide*.

Supported keywords and default values for the image copy process

For some keywords, the default value applied is different from the value applied to stand-alone Image Copy function jobs. The following table summarizes the keywords that you can use to control the image copy process in IMS Database Recovery Facility jobs. It also summarizes the default values applied to the image copy process.

Table 114: Supported keywords and default values for IMS Database Recovery Facility

Keyword	Can be specified as site default	Acceptable values	System default value under IMS Database Recovery Facility	Topic
COMP	Yes	Y or N	N	"COMP keyword" on page 167
COMPRTN	Yes	*routine*	FABJCMP3	"COMPRTN keyword" on page 169
DATACLAS	No	*class-name*	None	"DATACLAS keyword" on page 171
DSN	Yes	*expression*	None	"DSN keyword" on page 183
DSN2	Yes	*expression*	None	"DSN2 keyword" on page 183
EXPDT	No	*yyyyddd* or *yyddd*	None	"EXPDT keyword" on page 187

Keyword	Can be specified as site default	Acceptable values	System default value under IMS Database Recovery Facility	Topic
ICBUF	Yes	0 - 255	50	“ICBUF keyword” on page 200
ICCAT	Yes	Y or N	Y	“ICCAT keyword” on page 200
ICHLQ	Yes	*hlq1* or *(hlq1,hlq2)*	None	“ICHLQ keyword” on page 202
ICHLQ2	No	*hlq2*	None	“ICHLQ2 keyword” on page 204
ICNMRULE	Yes	Y or N	N	“ICNMRULE keyword” on page 206
KEYLABEL	Yes	*encryption_key_label*	None	“KEYLABEL keyword” on page 214
MGMTCLAS	No	*name*	None	“MGMTCLAS keyword” on page 217
RETPD	No	*nnnn*	None	“RETPD keyword” on page 228
SPACE	Yes	(CYL|TRK|*blk*, *primary*, *secondary*)	None	“SPACE keyword” on page 239
STACK	Yes	One of the following formats: • *ddname* • (*dd1*,*dd2*) • * • (*,*)	None	“STACK keyword” on page 241
STACKBASE	No	TEMP|REAL	TEMP	“STACKBASE keyword” on page 243
STORCLAS	No	*name*	None	“STORCLAS keyword” on page 244
UNIT	Yes	*unit-name* or *(unit-name,unit-count)*	SYSALLDA	“UNIT keyword” on page 261
UNIT2	No	*unit-name* or *(unit-name,unit-count)*	SYSALLDA	“UNIT2 keyword” on page 261
VIC	Yes	Y or N	N	“VIC keyword” on page 263
VICDSN	Yes	*dsname*	None	“VICDSN keyword” on page 264
VOLCNT	No	*nnn*	1	“VOLCNT keyword” on page 264
VOLSER	No	*volser* or (*vol1*,*vol2*,...)	None	“VOLSER keyword” on page 265
VOLSER2	No	*volser* or (*vol1*,*vol2*,...)	None	“VOLSER2 keyword” on page 266

Keyword	Can be specified as site default	Acceptable values	System default value under IMS Database Recovery Facility	Topic
WAITMSG	Yes	Y or N	Y	"WAITMSG keyword" on page 268
WAITTIME	Yes	*nnnn*	30	"WAITTIME keyword" on page 268

IMS Database Reorganization Expert

The Image Copy function integrates with IMS Database Reorganization Expert and creates batch image copies while the reorganization job is running.

The Image Copy function can be invoked by the Smart Reorg utility. The following two types of image copy processing are supported:

Type-A image copy

The image copy process runs during the reorganization phase. Image copies are taken while secondary indexes are being built and the database data sets are being reloaded to shadow data sets.

Type-B image copy

The image copy process runs after the reorganization phase. Image copies are taken after the completion of reloading shadow data sets and while building secondary indexes.

Supported image copy features

The following table summarizes the image copy features that are supported for IMS Database Reorganization Expert.

Table 115: Image copy features for IMS Database Reorganization Expert

Feature		Feature is supported?	
		Type-A image copy	Type-B image copy
Format of output image copy data set	Batch image copy	Yes	Yes
	Compressed image copy	Yes	Yes
	Fast Recovery image copy	-	-
Data access method	Advanced Image Copy Services support	-	-
	High Performance Input/Output interface	-	Yes Note 1
	OS access method	-	Yes Note 1
Processing type	Parallel processing	Yes Note 2	Yes
	Dynamic allocation of output image copy data sets Note 3	Yes	Yes
	Batch image copy and concurrent image copy	Batch	Batch
Processing option	Stacking output image copies	-	Yes
	Database pointer check (HASH Check)	Yes	Yes
	Checkpoint Restart	-	-
	Creating multiple image copies at one time (maximum number of image copies)	Yes (2)	Yes (2)

Feature		Feature is supported?	
		Type-A image copy	Type-B image copy
	Virtual image copy process	Yes	Yes
Processing option control	Site default table	Yes	Yes
IMS command interface	Integration with IMS Tools Online System Interface	-	-
IMS Tools KB support	Central management of reports	Yes Note 1	Yes Note 1

Notes:

1. Process is controlled by the tool that invokes IMS HP Image Copy.
2. The number of tasks processed in parallel is determined based on the number of scheduled database data sets in the database reorganization process.
3. The naming rule for the image copy data set that IMS HP Image Copy dynamically allocates conforms to the data set naming template. For more information, see "Data set naming template" on page 283.

How to request and control the image copy process

If you specify the IC=YES keyword in the REORG control statement block and supply allocation information for image copy data sets, an image copy is created for each reorganized database data set.

Other ICEIN control statement keywords are not mandatory. If you do not code other ICEIN control statement keywords, the image copy process is run with default values. If you want to specify keywords to control the image copy process, use the following resources:

- ICEIN DD statement of IMS Database Reorganization Expert JCL stream.
- IMS HP Image Copy site default table. The site default module must be included in the STEPLIB concatenation.

Usage notes: Image copy processing type (Type-A or Type-B) is determined based on the ICTYPE keyword in the REORG control statement block. If you do not specify the ICTYPE keyword, processing type is selected based on the database organization type.
Type-A image copy:

- AIC statement is always assumed, which means that batch image copies are created and data sets are processed in parallel.
- GLOBAL and AIC statements are supported. IC and WAIT statements can also be specified but these statements are not effective. GROUP, ACIC, and CIC statements are not supported.
- Tape devices cannot be specified on the DD statement for image copies of secondary index database data sets.
- When secondary index database data sets are processed and you specified the RETPD or EXPDT keyword, then you will receive message IEC507D (WTOR message MSGIEC507D). When this message is displayed, enter U to proceed.

Type-B image copy:

- AIC statement is always assumed, which means that batch image copies are created and data sets are processed in parallel. If you want to process data sets sequentially, specify IC statements in the ICEIN DD statement.
- GLOBAL, AIC, IC, and WAIT statements are supported. GROUP, ACIC, and CIC statements are not supported.

For information about invoking the Image Copy function in IMS Database Reorganization Expert jobs, see the *IMS Database Reorganization Expert User's Guide*.

Supported keywords and default values for the image copy process

The following table summarizes the keywords that you can use to control the image copy process.

Table 116: Supported keywords and default values for IMS Database Reorganization Expert

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topic
COMP	Yes	Yes	Y or N	N	"COMP keyword" on page 167
COMPRTN	Yes	Yes	*routine*	FABJCMP3	"COMPRTN keyword" on page 169
COMPMODE	Yes	No	Y or N	None	"COMPMODE keyword" on page 167
DATACLAS	No	Yes	*class-name*	None	"DATACLAS keyword" on page 171
DATACLAS2	No	Yes	*class-name*	None	"DATACLAS2 keyword" on page 171
DBBUF[Note 1]	Yes	Yes	*nnnn*	The value that is optimized for the data sets	"DBBUF keyword" on page 175
DBD	No	Yes	*dbdname*	None	"DBD keyword" on page 175
DDN	No	Yes	*ddname*	None	"DDN keyword" on page 178
DSN	Yes	No	*expression*	None	"DSN keyword" on page 183
DSN2	Yes	No	*expression*	None	"DSN2 keyword" on page 183
EXPDT	No	No	*yyyyddd* or *yyddd*	None	"EXPDT keyword" on page 187
EXPDT2	No	Yes	*yyyyddd* or *yyddd*	None	"EXPDT2 keyword" on page 187
GDGBASE	Yes	No	Y or N	N	"GDGBASE keyword" on page 193
GDGLIMIT	Yes	No	*nnn*	10	"GDGLIMIT keyword" on page 193
GROUPDIGITS	Yes	No	Y or (NO,DBSTAT)	Y	"GROUPDIGITS keyword" on page 194
HDPC	Yes	Yes	Y, (Y[,HISTORY,BITMAP,FSEMAP,MAXFSD]), N, or O	Y	"HDPC keyword" on page 196
HPIO	Yes	Yes	Y or N or X	Y	"HPIO keyword" on page 199
ICBUF	Yes	No	*nnnnn*	The value that is optimized for the image copy data sets	"ICBUF keyword" on page 200
ICCAT	Yes	No	Y or N	Y	"ICCAT keyword" on page 200
ICDALLOC	No	No	Y or N	Y	"ICDALLOC keyword" on page 201
ICHLQ	Yes	Yes	*hlq1* or *(hlq1,hlq2)*	None	"ICHLQ keyword" on page 202
ICHLQ2	No	Yes	*hlq2*	None	"ICHLQ2 keyword" on page 204
ICNMRULE	Yes	No	Y or N	N	"ICNMRULE keyword" on page 206

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topic
ICOUT	Yes	Yes	One of the following formats: • *ddname* • (*dd1*,*dd2*) • * • (*,*)	*	"ICOUT keyword" on page 207
IXKEYCHK	Yes	No	Y or N	N	"IXKEYCHK keyword" on page 213
KEYLABEL	Yes	Yes	'*key_label*'	None	"KEYLABEL keyword" on page 214
LBI	Yes	No	Y or N	N	"LBI keyword" on page 215
MGMTCLAS	No	Yes	*mgmt-class-name*	None	"MGMTCLAS keyword" on page 217
MGMTCLAS2	No	Yes	*mgmt-class-name*	None	"MGMTCLAS2 keyword" on page 217
MSGFREQ	Yes	Yes	*nnnn*	0	"MSGFREQ keyword" on page 219
PART	No	Yes	*partname*	None	"PART keyword" on page 224
RETPD	No	Yes	*parm*	None	"RETPD keyword" on page 228
RETPD2	No	Yes	*parm*	None	"RETPD2 keyword" on page 229
SPACE	Yes	Yes	(CYL|TRK|*blk*, *primary*, *secondary*)	None	"SPACE keyword" on page 239
STACK	Yes	Yes	One of the following formats: • *ddname* • (*dd1*,*dd2*) • * • (*,*)	None	"STACK keyword" on page 241
STACKBASE Note 2	Yes	No	TEMP|REAL	TEMP	"STACKBASE keyword" on page 243
STORCLAS	No	Yes	*store-class-name*	None	"STORCLAS keyword" on page 244
STORCLAS2	No	Yes	*store-class-name*	None	"STORCLAS2 keyword" on page 244
TASKCTL	Yes	No	*nnn*	None	"TASKCTL keyword" on page 246
T2CHK	Yes	Yes	(*nn*,*ll*)	(0,7)	"T2CHK keyword" on page 260
UNIT	Yes	Yes	*unit-name* or *(unit-name,unit-count)*	SYSALLDA	"UNIT keyword" on page 261
UNIT2	No	Yes	*unit-name* or *(unit-name,unit-count)*	SYSALLDA	"UNIT2 keyword" on page 261
USER	Yes	No	NO or *user-id* or (*user-id1*,*user-id2*,...)	NO	"USER keyword" on page 262
VIC	Yes	Yes	Y, N, (Y,ONPC), (Y,OFFPC), (N,ONPC), or (N,OFFPC)	N	"VIC keyword" on page 263
VICDSN	Yes	No	*dsname*	None	"VICDSN keyword" on page 264
VOLCNT	No	Yes	*nnn*	1	"VOLCNT keyword" on page 264
VOLSER	No	Yes	*volser* or (*vol1*,*vol2*,...)	None	"VOLSER keyword" on page 265

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topic
VOLSER2	No	Yes	*volser* or (*vol1*,*vol2*,...)	None	"VOLSER2 keyword" on page 266
WAITALOC	Yes	No	Y or N	Y	"WAITALOC keyword" on page 267
WAITMSG	Yes	No	Y or N	Y	"WAITMSG keyword" on page 268
WAITTIME	Yes	No	*nnnn*	30	"WAITTIME keyword" on page 268

Notes:

1. With Type-A image copy, the DBBUF parameter specifies the number of queuing buffers between the Reload and the Image Copy processes.
   For each data set of HDAM, HIDAM, SHISAM, or HISAM database except the HIDAM index, IMS HP Image Copy allocates the storage of the size, in bytes, of the block/CI size multiplied by the number specified in the DBBUF parameter. The default value for the DBBUF parameter for the data set is 250.

   For an HIDAM index data set and a secondary index data set, IMS HP Image Copy allocates the storage of the size, in bytes, of the index record size multiplied by the number specified in the DBBUF parameter. The default value for the DBBUF parameter for the index data set is 2000. If the value specified in the DBBUF parameter is less than 2000, IMS HP Image Copy adjusts it to 2000.
2. STACKBASE is supported only by Type-B image copy.

IMS HP Fast Path Utilities

The Image Copy function integrates with the functions and utilities of IMS HP Fast Path Utilities. If the Image Copy function is called by the HFPMAIN0 program, it creates batch image copies of DEDB area data sets. If the Image Copy function is called by the FPUTIL program, it creates concurrent image copies of DEDB area data sets.

Supported image copy features

The following table summarizes the image copy features that are supported for IMS HP Fast Path Utilities.

Table 117: Image copy features for IMS Fast Path Solution Pack: IMS HP Fast Path Utilities

Feature		Feature is supported?
Format of output image copy data set	Batch image copy	Yes
	Compressed image copy	Yes
	Fast Recovery image copy	-
Data access method	Advanced Image Copy Services support	-
	High Performance Input/Output interface	Yes Note 1
	OS access method	Yes Note 1
Processing type	Parallel processing	Yes
	Dynamic allocation of output image copy data sets Note 2	Yes
	Batch image copy and concurrent image copy	Batch/CIC Note 3
Processing option	Stacking output image copies	Yes
	Database pointer check (HASH Check)	-
	Checkpoint Restart	-

Feature		Feature is supported?
	Creating multiple image copies at one time (maximum number of image copies)	Yes (2)
Processing option control	Site default table	Yes
IMS command interface	Integration with IMS Tools Online System Interface	-
IMS Tools KB support	Central management of reports	Yes Note 1

Notes:

1. Process is controlled by the tool that invokes IMS HP Image Copy.
2. The naming rule for the image copy data set that IMS HP Image Copy dynamically allocates conforms to the data set naming template. For more information, see "Data set naming template" on page 283.
3. CIC is supported by IMS Fast Path Online Tools only.

How to request and control the image copy process

For the HFPMAIN0 program, an image copy is created for each area data set if you specify the ICOUT keyword on the HFPSYSIN DD statement. For the FPUTIL program, an image copy is created for each area data set if you specify the IC keyword on the FPXIN DD statement or the DASYSIN DD statement. You can also code an ICEIN DD statement and specify ICEIN control statements to gain granular control over the image copy process.

Control statements for the image copy process are read from the following resources:

- For the HFPMAIN0 program, HFPSYSIN DD statement of the HFPMAIN0 JCL stream
- For the FPUTIL program, FPXIN DD statement or the DASYSIN DD statement of the FPUTIL JCL stream
- ICEIN DD statement of the HFPMAIN0 JCL stream
- IMS HP Image Copy Site default table, if the site default module is found in the STEPLIB concatenation

Usage notes:

- For the HFPMAIN0 program, GLOBAL, AIC, IC, and WAIT statements are supported. GROUP, ACIC, and CIC statements are not supported. AIC statement is always assumed, which means that batch image copies are created and data sets are processed in parallel. If you want to process data sets sequentially, specify IC statements in the ICEIN DD statement.
- For the FPUTIL program, GLOBAL, ACIC, CIC, and WAIT statements are supported. GROUP, AIC, and IC statements are not supported. CIC statement is always assumed, which means that concurrent image copies are created and data sets are processed in parallel. If you want to process data sets sequentially, specify IC statements in the ICEIN DD statement.

For information about invoking the Image Copy function in IMS HP Fast Path Utilities jobs, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

Supported keywords and default values for the image copy process

The following table shows the ICEIN keywords that you can use to control the image copy process.

Table 118: Supported keywords and default values for IMS HP Fast Path Utilities

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics
AREA	No	Yes	*areaname*	None	"AREA keyword" on page 163

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics
COMP	Yes	Yes	Y or N	N	"COMP keyword" on page 167
COMPRTN	Yes	Yes	*routine*	FABJCMP4	"COMPRTN keyword" on page 169
COMPMODE	Yes	No	Y or N	None	"COMPMODE keyword" on page 167
DATACLAS	No	Yes	*data_class_name*	None	"DATACLAS keyword" on page 171
DATACLAS2	No	Yes	*class-name*	None	"DATACLAS2 keyword" on page 171
DBBUF	Yes	Yes	*nnnn*	The value that is optimized for the data sets	"DBBUF keyword" on page 175
DBD	No	Yes	*dbdname*	None	"DBD keyword" on page 175
DSN	Yes	No	*expression*	None	"DSN keyword" on page 183
DSN2	Yes	No	*expression*	None	"DSN2 keyword" on page 183
EXPDT	No	No	*yyyyddd* or *yyddd*	None	"EXPDT keyword" on page 187
EXPDT2	No	Yes	*yyyyddd* or *yyddd*	None	"EXPDT2 keyword" on page 187
GDGBASE	Yes	No	Y or N	N	"GDGBASE keyword" on page 193
GDGLIMIT	Yes	No	*nnn*	10	"GDGLIMIT keyword" on page 193
HPIO	Yes	Yes	Y or N or X	Y	"HPIO keyword" on page 199
ICBUF	Yes	No	*nnnnn*	The value that is optimized for the image copy data sets	"ICBUF keyword" on page 200
ICCAT	Yes	No	Y or N	Y	"ICCAT keyword" on page 200
ICDALLOC	No	No	Y or N	Y	"ICDALLOC keyword" on page 201
ICHLQ	Yes	Yes	*hlq1* or (*hlq1*,*hlq2*)	None	"ICHLQ keyword" on page 202
ICHLQ2	No	Yes	*hlq2*	None	"ICHLQ2 keyword" on page 204
ICNMRULE	Yes	No	Y or N	N	"ICNMRULE keyword" on page 206
ICOUT	Yes	Yes	One of the following formats: • *ddname* • (*dd1*,*dd2*) • * • (*,*)	*	"ICOUT keyword" on page 207
MGMTCLAS	No	Yes	*mgmt-class-name*	None	"MGMTCLAS keyword" on page 217
MGMTCLAS2	No	Yes	*mgmt-class-name*	None	"MGMTCLAS2 keyword" on page 217
MSGFREQ	Yes	Yes	*nnnn*	0	"MSGFREQ keyword" on page 219
RETPD	No	Yes	*parm*	None	"RETPD keyword" on page 228
RETPD2	No	Yes	*parm*	None	"RETPD2 keyword" on page 229

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics
SPACE	Yes	Yes	(CYL|TRK|*blk*, *primary*, *secondary*)	None	"SPACE keyword" on page 239
STACK	Yes	Yes	One of the following formats: • *ddname* • (*dd1*,*dd2*) • * • (*,*)	None	"STACK keyword" on page 241
STORCLAS	No	Yes	*store-class-name*	None	"STORCLAS keyword" on page 244
STORCLAS2	No	Yes	*store-class-name*	None	"STORCLAS2 keyword" on page 244
TASKCTL	Yes	No	*nnn*	None	"TASKCTL keyword" on page 246
UNIT	Yes	Yes	*unit-name* or (*unit-name*,*unit-count*)	SYSALLDA	"UNIT keyword" on page 261
UNIT2	No	Yes	*unit-name* or (*unit-name*,*unit-count*)	SYSALLDA	"UNIT2 keyword" on page 261
VOLCNT	No	Yes	*nnn*	1	"VOLCNT keyword" on page 264
VOLSER	No	Yes	*volser* or (*vol1*,*vol2*,...)	None	"VOLSER keyword" on page 265
VOLSER2	No	Yes	*volser* or (*vol1*,*vol2*,...)	None	"VOLSER2 keyword" on page 266
WAITALOC	Yes	No	Y or N	N	"WAITALOC keyword" on page 267
WAITMSG	Yes	No	Y or N	Y	"WAITMSG keyword" on page 268
WAITTIME	Yes	No	*nnnn*	30	"WAITTIME keyword" on page 268

IMS Online Reorganization Facility

The Image Copy function integrates with IMS Online Reorganization Facility and creates batch image copies for all the reorganized databases that are registered as recoverable with DBRC.

Supported image copy features

The following table summarizes the image copy features that are supported for IMS Online Reorganization Facility.

Table 119: Image copy features for IMS Database Solution Pack: IMS Online Reorganization Facility

Feature		Feature is supported?
Format of output image copy data set	Batch image copy	Yes
	Compressed image copy	Yes
	Fast Recovery image copy	Yes
Data access method	Advanced Image Copy Services support Note 1	Yes
	High Performance Input/Output interface	Yes
	OS access method	Yes
Processing type	Parallel processing	Yes
	Dynamic allocation of output image copy data sets Note 2	Yes

Feature		Feature is supported?
	Batch image copy and concurrent image copy	Batch
Processing option	Stacking output image copies	Yes
	Database pointer check (HASH Check)	Yes
	Checkpoint Restart	-
	Creating multiple image copies at one time (maximum number of image copies)	Yes (2)
	Virtual image copy process	Yes
Processing option control	Site default table	Yes
IMS command interface	Integration with IMS Tools Online System Interface	-
IMS Tools KB support	Central management of reports	Yes

Notes:

1. To enable Advanced Image Copy Services, APAR PI63757 must be applied to IMS HP Image Copy and APAR PI63786 must be applied to IMS Online Reorganization Facility. Only the COPY process of Advanced Image Copy Services is supported. If other process of Advanced Image Copy Services is requested, IMS HP Image Copy does not use Advanced Image Copy Services but instead uses HPIO or OS I/O method.
2. The naming rule for the image copy data set that IMS HP Image Copy dynamically allocates conforms to the data set naming template. If the index database is marked as non-recoverable in RECON, image copy data set will not be created for the index database. However, HASH pointer check will be done for the database if you specify HDPC=Y in ICEIN DD. For more information, see "Data set naming template" on page 283.

How to request and control the image copy process

If you specify the ICEIN(*ddname*) keyword on the REORG HRFSYSIN DD statement, an image copy is created for each reorganized database data set. You can also code *ddname* DD statement in the IMS Online Reorganization Facility JCL to gain granular control over the image copy process.

Control statements for the image copy process are read from the following resources:

- HRFSYSIN DD control statement of IMS Online Reorganization Facility JCL stream.
- ICEINDD statement of IMS Online Reorganization Facility JCL stream. This DD statement name must be the *ddname* that the ICEIN keyword of the HRFSYSIN DD statement specifies.
- IMS HP Image Copy site default table, if the site default module is found in the STEPLIB concatenation.

You can specify ICEIN control statement keywords in the ICEIN DD statement, but ICEIN control statement keywords are not mandatory. If you do not supply ICEIN control statement keywords or keywords related to the image copy process in the HRFSYSIN DD control statement, the image copy process is run with default values.

Usage notes:

- GLOBAL, AIC, IC, and WAIT statements are supported. GROUP, ACIC, and CIC statements are not supported.
- AIC statement is always assumed, which means that batch image copies are created and data sets are processed in parallel. If you want to process data sets sequentially, specify IC statements in the ICEIN DD statement.
- If you specify an ICEIN keyword that is not supported in IMS Online Reorganization Facility jobs, the keyword is ignored. No notification message is issued to alert that invalid ICEIN keywords are found.

- Some HRFSYSIN keywords are mutually exclusive with ICEIN control statement keywords. For example, if you specify IC.VIC=Y in the HRFSYSIN DD statement, then you cannot specify VIC=Y in the ICEIN DD statement. For such keywords, consider specifying the equivalent ICEIN keywords in the ICEIN DD. The following table summarizes the HRFSYSIN keywords that are mutually exclusive with ICEIN keywords.

Table 120: HRFSYSIN to ICEIN keyword migration table

HRFSYSIN keyword	Equivalent ICEIN keyword
IC.VIC(Y | N)	VIC=Y | N
IC.VICDSN(*dsname*)	VICDSN=*dsname*
PTRCHECK(Y | N | HISTORY | BITMAP | FSEMAP | MAXFSD)	HDPC=(Y | N | HISTORY | BITMAP | FSEMAP | MAXFSD)
IC1DSN	DSN=*expression*
IC2DSN	DSN2=*expression*
ICNUM	ICOUT=(*|*ddn*) for single image copy ICOUT=(*|*ddn*,*|*ddn*) for dual image copies
ICDYN	ICDALLOC=Y | N
ICHLQ	ICHLQ=*hlq*|(*hlq1*,*hlq2*) or ICHLQ=*hlq* for primary image copy ICHLQ2=*hlq2* for secondary image copy
ICMID	DSN=*expression* for primary image copy DSN2=*expression* for secondary image copy
ICID	DSN for primary image copy DSN2 for secondary image copy
ICTRLR	&GDG in DSN=*expression*
ICVOLCT	VOLCNT=*nnn*
IC.COMP	COMP=Y | N
IC.COMPRTN	COMPRTN=*routine*
ICDDN	ICOUT=(*ddn*) for single image copy ICOUT=(*ddn*,*ddn*) for dual image copies

For information about invoking the Image Copy function in IMS Online Reorganization jobs, see the *IMS Database Solution Pack IMS Online Reorganization Facility User's Guide*.

Supported keywords and default values for the image copy process

The following table shows the ICEIN keywords that you can use to control the image copy process.

Table 121: Supported keywords and default values for IMS Online Reorganization Facility

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics
COMP	Yes	Yes	Y or N	N	"COMP keyword" on page 167
COMPRTN	Yes	Yes	*routine*	FABJCMP1	"COMPRTN keyword" on page 169
COMPMODE	Yes	No	Y or N	None	"COMPMODE keyword" on page 167

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics
DATACLAS	No	Yes	*class-name*	None	"DATACLAS keyword" on page 171
DATACLAS2	No	Yes	*class-name*	None	"DATACLAS2 keyword" on page 171
DATA_MOVER	Yes	No	ADRDSSU or EMCSNAP	ADRDSSU	"DATA_MOVER keyword" on page 173
DBBUF	Yes	Yes	*nnnn*	The value that is optimized for the data sets	"DBBUF keyword" on page 175
DBD	No	Yes	*dbdname*	None	"DBD keyword" on page 175
DDN	No	Yes	*ddname*	None	"DDN keyword" on page 178
DSN	Yes	No	*expression*	None	"DSN keyword" on page 183
DSN2	Yes	No	*expression*	None	"DSN2 keyword" on page 183
DSNTYPE	Yes	Yes	LARGE or BASIC	BASIC	"DSNTYPE keyword" on page 184
EXPDT	No	No	*yyyyddd* or *yyddd*	None	"EXPDT keyword" on page 187
EXPDT2	No	Yes	*yyyyddd* or *yyddd*	None	"EXPDT2 keyword" on page 187
FASTIC	Yes	No	(*opt*,COPY) or NO	NO	"FASTIC keyword" on page 190
GDGBASE	Yes	No	Y or N	N	"GDGBASE keyword" on page 193
GDGLIMIT	Yes	No	*nnn*	10	"GDGLIMIT keyword" on page 193
GROUPDIGITS	Yes	No	Y or (NO,DBSTAT)	Y	"GROUPDIGITS keyword" on page 194
HDPC Note 1	Yes	Yes	Y|N|(Y,HISTORY, BITMAP,FSEMAP, MAXFSD,DBDIST, DEPDIST,SEGIO,VLSSUMM) Note 1	N	"HDPC keyword" on page 196
HPIO	Yes	Yes	Y or N or X	Y	"HPIO keyword" on page 199
ICBUF	Yes	No	*nnnnn*	The value that is optimized for the image copy data sets	"ICBUF keyword" on page 200
ICCAT	Yes	No	Y or N	Y	"ICCAT keyword" on page 200
ICDALLOC	No	No	Y or N	Y	"ICDALLOC keyword" on page 201
ICHLQ	Yes	Yes	*hlq1* or (*hlq1*,*hlq2*)	None	"ICHLQ keyword" on page 202
ICHLQ2	No	Yes	*hlq2*	None	"ICHLQ2 keyword" on page 204
ICHLQ*n*	Yes	Yes		None	"ICHLQn keyword" on page 205
ICNMRULE	Yes	No	Y or N	N	"ICNMRULE keyword" on page 206

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics
ICOUT Note 2	Yes	Yes	One of the following formats: Note 2 • *ddname* • (*dd1*,*dd2*) • * • (*,*) • (*,%STACK)	*	"ICOUT keyword" on page 207
ITKBLOAD	Yes	No	*dsn* or *NO	*NO	"ITKBLOAD keyword" on page 212
ITKBSRVR Note 3	Yes	No	*servername* or *NO	*NO	"ITKBSRVR keyword" on page 213
IXKEYCHK	Yes	No	Y or N	N	"IXKEYCHK keyword" on page 213
KEYLABEL	Yes	Yes	'*key_label*"	None	"KEYLABEL keyword" on page 214
LBI	Yes	No	Y or N	N	"LBI keyword" on page 215
MGMTCLAS	No	Yes	*mgmt-class-name*	None	"MGMTCLAS keyword" on page 217
MGMTCLAS2	No	Yes	*mgmt-class-name*	None	"MGMTCLAS2 keyword" on page 217
MSGFREQ	Yes	Yes	*nnnn*	0	"MSGFREQ keyword" on page 219
OFFLDSTACK	Yes	Yes	*ddn*, *, or N	N	"OFFLDSTACK keyword" on page 223
OFFLDTYPE	Yes	Yes	N, S, or F	N	"OFFLDTYPE keyword" on page 224
PART	No	Yes	*partname*	None	"PART keyword" on page 224
RETPD	No	Yes	*parm*	None	"RETPD keyword" on page 228
RETPD2	No	Yes	*parm*	None	"RETPD2 keyword" on page 229
SHDWDELETE	Yes	No	EACH or ALL	EACH	"SHDWDELETE keyword" on page 234
SHDWDSN	Yes	No	*shdwhlq*.SHDW.*dbdname.ddname* or *name_expression*	*shdwhlq*.SHDW.*dbdname.ddname*	"SHDWDSN keyword" on page 235
SHDWHLQ	Yes	Yes	*hlq*	None	"SHDWHLQ keyword" on page 235
SHDWMGMTCL	Yes	Yes	*mgmt_class_name*	None	"SHDWMGMTCL keyword" on page 236
SHDWSTORCL	Yes	Yes	*store_class_name*	None	"SHDWSTORCL keyword" on page 237
SHDWVOLSER	Yes	Yes	*volser* or (*volser1*,*volser2*,...)	None	"SHDWVOLSER keyword" on page 238
SPACE	Yes	Yes	(CYL|TRK|*blk*, *primary*, *secondary*)	None	"SPACE keyword" on page 239
SPMN	Yes	Yes	YES or NO	NO	"SPMN keyword" on page 240

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics
STACK	Yes	Yes	One of the following formats: • *ddname* • (*dd1*,*dd2*) • * • (*,*)	None	"STACK keyword" on page 241
STACKBASE	Yes	No	TEMP or REAL	TEMP	"STACKBASE keyword" on page 243
STORCLAS	No	Yes	*store-class-name*	None	"STORCLAS keyword" on page 244
STORCLAS2	No	Yes	*store-class-name*	None	"STORCLAS2 keyword" on page 244
TASKCTL	Yes	No	*nnn*	None	"TASKCTL keyword" on page 246
THRESHOLDS	Yes	Yes	*keyword=value*|(*keyword1=value1*, *keyword2=value2*,...)	-	"THRESHOLDS keyword" on page 247
T2CHK	Yes	Yes	(*nn*,*ll*)	(0,7)	"T2CHK keyword" on page 260
UNIT	Yes	Yes	*unit-name* or (*unit-name*,*unit-count*)	SYSALLDA	"UNIT keyword" on page 261
UNIT2	No	Yes	*unit-name* or (*unit-name*,*unit-count*)	SYSALLDA	"UNIT2 keyword" on page 261
USER	Yes	No	NO or *user-id* or (*user-id1*,*user-id2*,...)	NO	"USER keyword" on page 262
VIC Note 4	Yes	Yes	Y or N or (Y or N,ONPC or OFFPC) Note 4	N	"VIC keyword" on page 263
VICDSN	Yes	No	*expression*	None	"VICDSN keyword" on page 264
VOLCNT	No	Yes	*nnn*	1	"VOLCNT keyword" on page 264
VOLSER	No	Yes	*volser* or (*vol1*,*vol2*,...)	None	"VOLSER keyword" on page 265
VOLSER2	No	Yes	*volser* or (*vol1*,*vol2*,...)	None	"VOLSER2 keyword" on page 266
WAITALOC	Yes	No	Y or N	N	"WAITALOC keyword" on page 267
WAITMSG	Yes	No	Y or N	Y	"WAITMSG keyword" on page 268
WAITTIME	Yes	No	*nnnn*	30	"WAITTIME keyword" on page 268
ZIIPMODE	Yes	No	COND or NEVER	NEVER	"ZIIPMODE keyword" on page 269

Keyword	Can be specified in ICEIN GLOBAL statement?	Can be specified in ICEIN IC or AIC statement?	Acceptable values	System default	Topics

Notes:

1. HDPC=O is treated as HDPC=Y. CHAINDIST and COMPFACT parameters are not supported. If specified, they are ignored.
2. %NO is not supported for the ICOUT keyword. If specified, the job ends due to ICEIN control statement error.
3. To store IMS HP Image Copy reports and IMS HP Pointer Checker reports in the IMS Tools KB repository in IMS Online Reorganization Facility jobs, specify the IMS Tools KB server name by using one of the following keywords:
   - When you process HALDBs, specify the server XCF group name on the ITKBSERVER keyword in HRFSYSIN DD. The ITKBSRVR keyword in ICEIN DD or in the IMS HP Image Copy site default table is not effective for HALDBs. If you do not specify the ITKBSERVER keyword, and if the ITKBSRVR keyword is specified in ICEIN DD or in the IMS HP Image Copy site default table, a warning message (FABJ0221W) is issued.
   - When you process non-HALDBs, specify the server XCF group name either on the ITKBSRVR keyword in ICEIN DD or on the ITKBSERVER keyword in HRFSYSIN DD. The ITKBSRVR keyword in the IMS HP Image Copy site default table is also effective.
4. If ICEIN(*ddname*) keyword is not specified in the HRFSYSIN DD, VIC=N is applied. In this case, the VIC keyword value that is set for the site default is ignored.

IMS HALDB Toolkit

The Image Copy function integrates with IMS HALDB Toolkit and creates image copies while the IMS HALDB Toolkit job is running.

Supported image copy features

The following table summarizes the image copy features that are supported for IMS HALDB Toolkit.

Table 122: Image copy features for IMS HALDB Toolkit

Feature		Feature is supported?
Format of output image copy data set	Batch image copy	Yes
	Compressed image copy	Yes
	Fast Recovery image copy	-
Data access method	Advanced Image Copy Services support	-
	High Performance Input/Output interface	Yes
	OS access method	Yes Note 1
Processing type	Parallel processing	Yes Note 2
	Dynamic allocation of output image copy data sets	- Note 3
	Batch image copy and concurrent image copy	Batch
Processing option	Stacking output image copies	-
	Database pointer check (HASH Check)	Yes
	Checkpoint Restart	-

Feature		Feature is supported?
	Creating multiple image copies at one time (maximum number of image copies)	Yes (2)
	Virtual image copy process	Yes
Processing option control	Site default table	Yes
IMS command interface	Integration with IMS Tools Online System Interface	-
IMS Tools KB support	Central management of reports	Yes "4" on page 384

Notes:

1. To use the OS access method, define HPIO=N in the IMS HP Image Copy site default table.
2. When IMS HP Image Copy processes multiple partitions or data set groups, it always processes them in parallel. The number of tasks processed in parallel is determined based on the TASKCTL keyword in the site default table.
3. Process is controlled by the tool that invokes IMS HP Image Copy.
4. To store reports in the IMS Tools KB repository, use the ITKBLOAD and ITKBSRVR keywords to define IMS Tools KB information in the IMS HP Image Copy site default table.

How to request and control the image copy process

To invoke the image copy process, specify the IMS HALDB Toolkit command parameters that are related to the image copy process in the IMS HALDB Toolkit job.

Control statements for the image copy process are read from the following resources:

- Command parameters of IMS HALDB Toolkit
- IMS HP Image Copy site default table, if the site default module is found in the STEPLIB concatenation

ICEIN DD statement is not supported. For more information about invoking the Image Copy function in IMS HALDB Toolkit jobs, see the *IMS HALDB Toolkit User's Guide*.

Reference

The reference information provides information for improving the performance of IMS HP Image Copy jobs and sample members in the sample library.

Topics:

- "Performance tips for IMS HP Image Copy" on page 385
- "Sample library members" on page 390
- "How to read syntax diagrams" on page 391

Performance tips for IMS HP Image Copy

The following topics provide techniques for tuning and improving the performance of IMS HP Image Copy jobs.

Topics:

- "Tuning the image copy process" on page 385
- "Tuning the recovery process" on page 387
- "Tuning the create image copy process" on page 388
- "Tuning the image copy process (IMS compatible JCL)" on page 388
- "Tuning the recovery process (IMS compatible JCL)" on page 389

Tuning the image copy process

You can tune the image copy process invoked by the FABJMAIN program.

I/O buffer tuning for database data sets

IMS HP Image Copy optimizes the number of I/O buffers and uses the optimized number of I/O buffers for database data sets. This is effective for the standard I/O process. Optimized value is used under the following conditions:

- The database data set is the primary index data set of HIDAM, HISAM, or SHISAM, or a secondary index.
- The database is a HDAM, HIDAM, HALDB, or DEDB and the high performance I/O (HPIO) interface is disabled.
- The database is a full-function database, HALDB, or DEDB and the FASTIC=(,FDUMP) option of Advanced Image Copy Services is used. (The optimized value is used for reading shadow database data sets.)

The optimized number of I/O buffers is as follows:

VSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFND of VSAM. The optimized BUFND is calculated by the following expressions:

Table 123: VSAM data sets

Database CI size	Optimized number of BUFND
Less than 2 K	Number of CIs in 1 CA x 1/2
Equal to or greater than 2 K	Number of CIs in 1 CA x 1/4

OSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFNO of OSAM. The optimized BUFNO depends on the size of the OSAM block.

Table 124: OSAM data sets	
Database block size	**Optimized number of BUFNO**
size < 6144 (2 K x 3)	30
6145 =< size =< 8192 (2 K x 4)	24
8193 =< size =< 10240 (2 K x 5)	20
10241 =< size =< 12288 (2 K x 6)	17
12289 =< size =< 14336 (2 K x 7)	15
14337 =< size =< 16384 (2 K x 8)	13
16385 =< size =< 18432 (2 K x 9)	12
18433 =< size =< 20480 (2 K x 10)	11
20481 =< size =< 22528 (2 K x 11)	10
22529 =< size =< 24576 (2 K x 12)	09
24577 =< size =< 28672 (2 K x 14)	08
28673 =< size	07

To change the value in the I/O buffer for a database data set, do as follows:

- Specify the value of BUFND or BUFNO using the DBBUF keyword of the ICEIN control statement.
- If the database data set is allocated by a JCL DD card, specify BUFND or BUFNO using the JCL DD card of the database data set.

When you enable High Performance I/O (HPIO), the buffer number of the database access is automatically determined by HPIO. In this case, you cannot change the number by using IMS HP Image Copy JCL or ICEIN control statements. In the FDUMP process of Advanced Image Copy Services, the I/O buffers are used for reading the shadow data set.

If you use Advanced Image Copy Services, I/O buffer cannot be used.

Buffer tuning for image copy data sets

The default value of the I/O buffer for the image copy data set, the log data set, or the change accumulation data set is BUFNO=50.

These buffer numbers depend on what tape unit is being used. If the image copy data set resides on a DASD, you can improve performance by increasing the buffer numbers.

To change the value of the I/O buffer for image copy data set, specify the value for BUFNO using the ICBUF keyword in the ICEIN control statement. If dynamic allocation is not used, specify BUFND or BUFNO using the JCL DD card of the image copy database data set.

The I/O buffer for image copy data set cannot be tuned when creating image copies in Fast Recovery format using Advanced Image Copy Services.

IDRC-enabled tape devices

When you use a tape for output image copy data set on an IDRC-enabled device, use the FABJCMP2 compression routine. FABJCMP2 compresses the FSE portion of the database record in the image copy data set. The FSE compression in FABJCMP2 is done by the program of IMS HP Image Copy before the data is written to tape, then, in the device, IDRC compresses the data through the hardware process. As a result, the output data volume is decreased by the FSE compression and elapsed time is decreased.

Other compression routines are ignored when used with IDRC, and image copy data set is not compressed by IMS HP Image Copy.

> **Note:** Do not use the FABJCMP2 routine for a DEDB that has SDEP segments.

Tuning the recovery process

You can tune the recovery process invoked by the FABJMAIN program.

I/O buffer tuning for database data sets

IMS HP Image Copy optimizes the number of I/O buffers and uses the optimized number of I/O buffers for database data sets. This is effective for the standard I/O process. The optimized number of I/O buffers are used for writing database records from input image copy data set.

The optimized number of I/O buffers is as follows:

VSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFND of VSAM. The optimized BUFND is calculated by the following expressions:

Table 125: VSAM data sets

Database CI size	Optimized number of BUFND
Less than 2 K	Number of CIs in 1 CA x 1/2
Equal or greater than 2 K	Number of CIs in 1 CA x 1/4

OSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFNO of OSAM. The optimized BUFNO depends on the size of the OSAM block.

Table 126: OSAM data sets

Database block size	Optimized number of BUFNO
size < 6144 (2 K x 3)	30
6145 =< size =< 8192 (2 K x 4)	24
8193 =< size =< 10240 (2 K x 5)	20
10241 =< size =< 12288 (2 K x 6)	17
12289 =< size =< 14336 (2 K x 7)	15
14337 =< size =< 16384 (2 K x 8)	13
16385 =< size =< 18432 (2 K x 9)	12
18433 =< size =< 20480 (2 K x 10)	11
20481 =< size =< 22528 (2 K x 11)	10
22529 =< size =< 24576 (2 K x 12)	09
24577 =< size =< 28672 (2 K x 14)	08
28673 =< size	07

To change the value in the I/O buffer for a database data set, do as follows:

- Specify the value of BUFND or BUFNO using the DBBUF keyword of the ICEIN control statement.
- If dynamic allocation is not used, specify BUFND or BUFNO using the JCL DD card of the database data set.

Buffer tuning for input data sets

The default value of the I/O buffer for the image copy data set, the log data set, or the change accumulation data set is BUFNO=50.

These buffer numbers depend on what tape unit is being used. If the image copy data set resides on a DASD, you can improve the performance by increasing the buffer numbers.

The buffer number can be changed by specifying the value for BUFNO by specifying the DSBUF keyword in the ICEIN control statement. If dynamic allocation is not used, specify BUFNO using the JCL DD card of the image copy database data set, the log data set, or the change accumulation data set.

Tuning the create image copy process

You can tune the create image copy process invoked by the FABJMAIN program.

I/O Buffer tuning for input data sets

The default value of the I/O buffer of the input image copy data set is BUFNO=15.

The buffer numbers depend on what tape unit is being used. If the input image copy data set resides on a DASD, you can improve the performance by increasing the buffer numbers.

The buffer number can be changed by specifying the value for BUFNO using the DSBUF keyword in the ICEIN control statement. If dynamic allocation is not used, specify BUFNO using the JCL DD card of the input image copy database data set.

Buffer tuning for output data sets

The default value of the I/O buffer for the output image copy data set is BUFNO=15.

The buffer numbers depend on what tape unit is being used. If the output image copy data set resides on a DASD, you can improve the performance by increasing the buffer numbers.

The buffer number can be changed by specifying the value for BUFNO using the ICBUF keyword in the ICEIN control statement. If dynamic allocation is not used, specify BUFNO using the JCL DD card of the output image copy database data set.

Tuning the image copy process (IMS compatible JCL)

You can tune the image copy process that is called from IMS compatible JCL.

I/O buffer tuning for database data sets

IMS HP Image Copy optimizes the number of I/O buffers and uses the optimized number of I/O buffers for a database data set. This is effective for the standard I/O process.

Optimized value is used under the following conditions:

- The database data set is the primary index data set of HIDAM, HISAM, or SHISAM, or a secondary index.
- The database is HDAM, HIDAM, HALDB, or DEDB and the high performance I/O (HPIO) interface is disabled.

The optimized number of I/O buffers is as follows:

VSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFND of VSAM. The optimized BUFND is calculated by the following expressions:

Table 127: VSAM data sets

Database CI size	Optimized number of BUFND
Less than 2 K	Number of CIs in 1 CA x 1/2
Equal or greater than 2 K	Number of CIs in 1 CA x 1/4

OSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFNO of OSAM. The optimized BUFNO depends on the size of the OSAM block.

Table 128: OSAM data sets

Database block size	Optimized number of BUFNO
size < 6144 (2 K x 3)	30
6145 =< size =< 8192 (2 K x 4)	24
8193 =< size =< 10240 (2 K x 5)	20
10241 =< size =< 12288 (2 K x 6)	17
12289 =< size =< 14336 (2 K x 7)	15

Database block size	Optimized number of BUFNO
14337 =< size =< 16384 (2 K x 8)	13
16385 =< size =< 18432 (2 K x 9)	12
18433 =< size =< 20480 (2 K x 10)	11
20481 =< size =< 22528 (2 K x 11)	10
22529 =< size =< 24576 (2 K x 12)	09
24577 =< size =< 28672 (2 K x 14)	08
28673 =< size	07

If you need to change the optimized number, specify BUFND or BUFNO using the JCL DD card of the database data set.

If you use the High Performance I/O (HPIO) process, the buffer number of the database access is automatically determined by HPIO. In this case, you cannot change the number by using IMS HP Image Copy JCL.

Buffer tuning for image copy data sets

The default value of the I/O buffer of the image copy data set is BUFNO=50.

The buffer numbers depend on what tape unit is being used. If the image copy data set resides on a DASD, you can improve the performance by increasing the buffer numbers.

To change the value of the I/O buffer of the image copy data set, specify BUFND or BUFNO using the JCL DD card of the image copy database data set.

IDRC-enabled tape devices

When you use a tape for output image copy data set on an IDRC-enabled device, use the FABJCMP2 compression routine. FABJCMP2 compresses the FSE portion of the database record in the image copy data set. The FSE compression in FABJCMP2 is done by the program of IMS HP Image Copy before the data is written to tape, then, in the device, IDRC compresses the data through the hardware process. As a result, the output data volume is decreased by the FSE compression and elapsed time is decreased.

Other compression routines are ignored when used with IDRC, and image copy data set is not compressed by IMS HP Image Copy.

> **Note:** Do not use the FABJCMP2 routine for a DEDB that has SDEP segments.

Tuning the recovery process (IMS compatible JCL)

You can tune the recovery process that is called from IMS compatible JCL.

I/O buffer tuning for database data sets

IMS HP Image Copy optimizes the number of I/O buffers and uses the optimized number of I/O buffers for a database data set. The optimized number of I/O buffers are used for writing database records from input image copy data set.

The optimized number of I/O buffers is as follows:

VSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFND of VSAM. The optimized BUFND is calculated by the following expression:

Table 129: VSAM data sets

Database CI size	Optimized number of BUFND
Less than 2 K	Number of CIs in 1 CA x 1/2
Equal or greater than 2 K	Number of CIs in 1 CA x 1/4

OSAM data sets

IMS HP Image Copy sets optimized number of buffers in BUFNO of OSAM. The optimized BUFNO depends on the size of an OSAM block.

Table 130: OSAM data sets

Database block size	Optimized number of BUFNO
size < 6144 (2 K x 3)	30
6145 =< size =< 8192 (2 K x 4)	24
8193 =< size =< 10240 (2 K x 5)	20
10241 =< size =< 12288 (2 K x 6)	17
12289 =< size =< 14336 (2 K x 7)	15
14337 =< size =< 16384 (2 K x 8)	13
16385 =< size =< 18432 (2 K x 9)	12
18433 =< size =< 20480 (2 K x 10)	11
20481 =< size =< 22528 (2 K x 11)	10
22529 =< size =< 24576 (2 K x 12)	09
24577 =< size =< 28672 (2 K x 14)	08
28673 =< size	07

To change the value in the I/O buffer for a database data set, specify BUFND or BUFNO by using the JCL DD card of the database data set.

Buffer tuning for input data sets

The default value of the I/O buffer of the image copy data set, the log data set, or the change accumulation data set is BUFNO=50.

The buffer numbers depend on what tape unit is being used. If the image copy data set resides on a DASD, you can improve performance by increasing the buffer numbers.

The buffer number can be changed by specifying the value for BUFNO by using the JCL DD card of the image copy database data set, the log data set, or the change accumulation data set.

Sample library members

The sample library (SHPSSAMP) that is supplied with IMS HP Image Copy contains the following sample members that you can use as models to create your own jobs.

FABJDFLJ

This member contains the JCL sample to generate a site default table for the FABJMAIN program. Run this member if you want to generate a site default table for use with the functions that are run by the FABJMAIN program or for the image copy process that is started in other IMS Tools jobs.

FABJDFLX

This member contains the JCL sample to generate a site default table for use with IMS compatible JCL.

FABJEIC

This member contains the sample procedure to run the Image Copy function with IMS compatible JCL with the HASH check option enabled.

FABJICD1

This member contains sample default values for the DBRC GENJCL function of IMS. The values in this member are applied as default values when you generate IMS compatible JCL with the GENJCL.IC command.

FABJICD2

This member contains sample default values for the DBRC GENJCL function of IMS. The values in this member are applied as default values when you generate IMS compatible JCL with the GENJCL.IC command.

FABJICS0

This member contains the sample skeletal JCL to generate IMS compatible JCL for the Image Copy function with the DBRC GENJCL function of IMS.

FABJITKB

This member contains the JCL sample to define IMS HP Image Copy reports to the IMS Tools Knowledge Tool report repository.

FABJRVGR

This member contains the sample skeletal JCL to generate FABJMAIN JCL for the Recovery function with the DBRC GENJCL function of IMS.

FABPDA

This member contains the sample procedure for the DBD Analysis program, which is used with multiple-step HASH Check.

FABPHE

This member contains the sample procedure for HASH Evaluation program, which is used with multiple-step HASH Check.

FABPIC

This member contains the sample procedure for the Image Copy function with multiple-step HASH Check.

FABPICHE

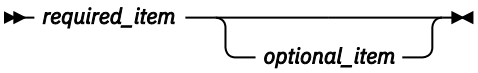
This member contains the sample procedure for the Image Copy function with single-step HASH Check.

How to read syntax diagrams

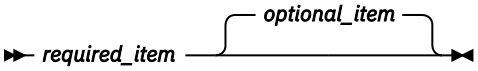
The following rules apply to the syntax diagrams that are used in this information:

- Read the syntax diagrams from left to right, from top to bottom, following the path of the line. The following conventions are used:
  - The >>--- symbol indicates the beginning of a syntax diagram.
  - The ---> symbol indicates that the syntax diagram is continued on the next line.
  - The >--- symbol indicates that a syntax diagram is continued from the previous line.
  - The --->< symbol indicates the end of a syntax diagram.
- Required items appear on the horizontal line (the main path).

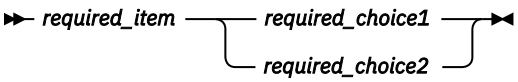
- Optional items appear below the main path.



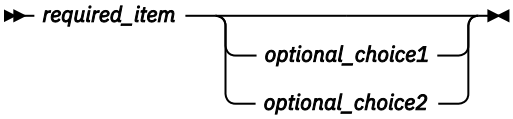
If an optional item appears above the main path, that item has no effect on the execution of the syntax element and is used only for readability.



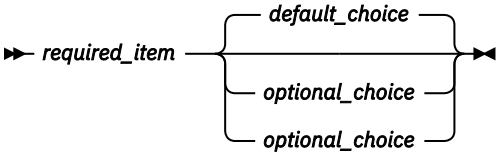
- If you can choose from two or more items, they appear vertically, in a stack.
  If you *must* choose one of the items, one item of the stack appears on the main path.



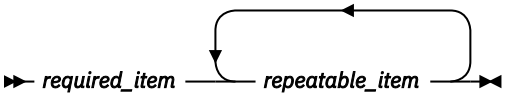
If choosing one of the items is optional, the entire stack appears below the main path.



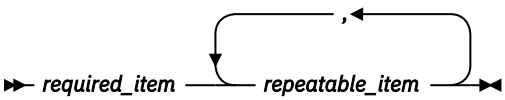
If one of the items is the default, it appears above the main path, and the remaining choices are shown below.



- An arrow returning to the left, above the main line, indicates an item that can be repeated.



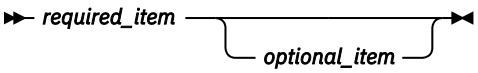
If the repeat arrow contains a comma, you must separate repeated items with a comma.



A repeat arrow above a stack indicates that you can repeat the items in the stack.

- Sometimes a diagram must be split into fragments. The syntax fragment is shown separately from the main syntax diagram, but the contents of the fragment should be read as if they are on the main path of the diagram.

fragment-name



- A b symbol indicates one blank position.
- Keywords, and their minimum abbreviations if applicable, appear in uppercase. They must be spelled exactly as shown. Variables appear in all lowercase italic letters (for example, column-name). They represent user-supplied names or values.
- Separate keywords and parameters by at least one space if no intervening punctuation is shown in the diagram.
- Enter punctuation marks, parentheses, arithmetic operators, and other symbols exactly as shown in the diagram.
- Footnotes are shown by a number in parentheses; for example, (1).

Troubleshooting

The following topics provide troubleshooting information to diagnose and resolve IMS HP Image Copy problems.

Topics:

- "Messages and codes" on page 393
- "Diagnostics Aid" on page 514

Messages and codes

The following topics describe the return codes, abend codes, and messages that are issued during the execution of IMS HP Image Copy.

Topics:

- "Return codes" on page 393
- "Abend codes" on page 397
- "Messages" on page 397
- "Gathering diagnostic information" on page 514

Return codes

The following topics explain the return codes of IMS HP Image Copy.

IMS HP Image Copy return codes

The following return codes are returned by the IMS HP Image Copy functions run by the FABJMAIN program.

Table 131: Return codes of IMS HP Image Copy (FABJMAIN)

Code	Meaning
0	The requested operation was completed successfully.
2	One of the following, or combination of 1 and 2, or 1 and 3: 1. Detected one or more errors during DEDB Pointer Checker HASH Check. 2. Detected one or more unknown data (T2) or pointer errors during HD Pointer Checker multiple-step HASH Check. 3. Detected unknown data (T2) and no other errors during HD Pointer Checker single-step HASH Check.
4	A warning message was written to the SYSPRINT data set. or Detected database errors during HD Pointer Checker HASH Check. This code is returned only from single-step HASH Check jobs. To obtain more information about the database error, run HD Pointer Checker with the full pointer check option.
8	One or more operations ended unsuccessfully.
16	An ICEIN control statement error. No operation was completed.

Image Copy function return codes (IMS compatible JCL)

The following return codes are returned by the Image Copy function when the function is called by IMS compatible JCL.

Table 132: Return codes of the Image Copy function (DFSUDMP0)

Code	Meaning
0	The requested operation was completed successfully.
2	Detected one or more errors during Pointer Checker HASH Check.
4	A warning message was written to the SYSPRINT data set.
8	One or more operations ended unsuccessfully.
16	Severe error. No operation was completed.

Recovery function return codes (IMS compatible JCL)

The following return codes are returned by the Recovery function when the function is called by IMS compatible JCL.

Table 133: Return codes of the Recovery function (DFSURDB0)

Code	Meaning
0	The requested operation was completed successfully.
4	A warning message was written to the SYSPRINT data set.
16	Severe error. No operation was completed.

Checkpoint Restart function return codes

The following return codes are returned by the Checkpoint Restart function.

Table 134: Return codes of the Checkpoint Restart function (FABJXCR)

FABJMAIN (pending return code) (See Note)	IC status	Checkpoint Restart data set final status	Return code
RC=0, 2 or 4	All image copies completed successfully.	Checkpoint state; not to be used for restart.	Same as FABJMAIN pending return code.
0, 2, or 4	At least one image copy failed.	Checkpoint Restart can be restarted. Successful image copy databases and/or stacks are bypassed.	8 **Note:** This return code might mask a previous return code of 2 or 4.
8 or higher	At least one image copy failed.	Checkpoint Restart can be restarted. Successful image copy databases and/or stacks are bypassed.	Same as FABJMAIN pending return code.

Note: FABJMAIN return code just prior to calling Checkpoint Restart TERM.

Site Default Generation utility return codes

The following return codes are returned by the Site Default Generation utility.

Table 135: Return codes of the Site Default Generation utility (FABJTGEN)

Code	Meaning
0	Ended successfully. Source code of the site default table (FABJGLB0) was created successfully.
8	Ended unsuccessfully. Control statement errors were detected.

DBD Analysis program return codes

The following return codes are returned by the DBD Analysis program.

Table 136: Return codes of the DBD Analysis program (FABPANAL)

Code	Meaning
0	Ended successfully. The DBDEFCTL members were created successfully.
8	Ended unsuccessfully. Control statement errors were detected.

HASH Evaluation program return codes

The following return codes are returned by the HASH Evaluation program.

Table 137: Return codes of the HASH Evaluation program (FABPHCTL)

Code	Meaning
0	Ended successfully. Database data sets were processed successfully by the HASH evaluation program. This, however, does not mean that the database is error-free.
4	Ended successfully, but database errors were detected. To obtain more information about database errors, run HD Pointer Checker with the full-pointer check option.
8	Ended unsuccessfully. Control statement errors were detected.

Return codes and reason codes under IMS Database Reorganization Expert

The following return codes and reason codes are returned by the IMS HP Image Copy function when the function is called in IMS Database Reorganization Expert jobs.

When the Image Copy function is invoked under IMS Database Reorganization Expert and the Image Copy function or HASH Pointer Check detects an error, the error is shown with the return code and reason code of message FABJ0999E. Other associated error messages are written to IMS HP Image Copy reports.

The following table summarizes the return codes and reason codes of each IMS HP Image Copy function under IMS Database Reorganization Expert.

Table 138: Return codes and reason codes under IMS Database Reorganization Expert

FUNC	Return code (Full word)	Reason code (Full word)	Reason
INIT1	F'4'	X'00000001'	IMS HP Pointer Checker is not installed or the IMS HP Pointer Checker level is not high enough for processing under IMS Database Reorganization Expert.
		X'00000002'	The IMS HP Pointer Checker level is not correct.
	F'8'	X'00000001'	An IMS HP Image Copy internal error.
		X'0001*nnnn*'	An internal error. The parameters from IMS Database Reorganization Expert are incorrect.
		X'0003*nnnn*'	An error in the OS macro.

FUNC	Return code (Full word)	Reason code (Full word)	Reason
	F'16'	X'00000000'	ICEIN control card error.
INIT2	F'8'	X'0000*nnnn*'	An internal error in IMS HP Image Copy.
		X'0001*nnnn*'	An internal error. The parameters from IMS Database Reorganization Expert are incorrect.
		X'0002*nnnn*'	An error in IMS HP Pointer Checker FUNC=INIT. *nnnn* is the return code from IMS HP Pointer Checker.
		X'0003*nnnn*'	An error in the OS macro.
		X'0004*nnnn*'	An internal macro error.
DUMP Type=A	F'04'		Either the primary or the secondary IC data set has an error, but the process is continued.
	F'8'	X'0000*nnnn*'	An internal error in IMS HP Image Copy.
		X'0001*nnnn*'	An internal error. The parameters from IMS Database Reorganization Expert are incorrect.
	F'16'		An error is detected during the IC process. The detail of the error of IMS HP Image Copy or IMS HP Pointer Checker is reported as an error message.
	F'24'	X'00000000'	The IC process is forced to stop by IMS Database Reorganization Expert.
DUMP Type=B	F'4'		The pointer error is found during the IMS HP Pointer Checker scan.
	F'8'	X'0000*nnnn*'	An internal error in IMS HP Image Copy.
		X'0001*nnnn*'	An internal error. The parameters from IMS Database Reorganization Expert are incorrect.
	F'16'		An error is detected during the IC process. The detail of the error of IMS HP Image Copy or IMS HP Pointer Checker is reported as an error message.
TERM	F'8'	X'0000*nnnn*'	An internal error in IMS HP Image Copy.
		X'0001*nnnn*'	An internal error. The parameters from IMS Database Reorganization Expert are incorrect.
		X'0002*nnnn*'	An error is detected in the IMS HP Pointer Checker process. *nnnn* is the return code from IMS HP Pointer Checker.
		X'0003*nnnn*'	An IMS HP Image Copy or a pointer error is detected. *nnnn* is the return code of FUNC=DUMP.
		X'00040001'	FUNC=DUMP is not called.
NTFC	F'4'	X'0000*nnnn*'	An internal error in IMS HP Image Copy.
		X'00000001'	An error is detected in primary IC during the IC function. The primary IC is registered with DBRC as an error IC.
		X'00000002'	An error is detected in secondary IC during the IC function. The secondary IC is registered with DBRC as an error IC.
	F'8'	X'0001*nnnn*'	An internal error. The parameters from IMS Database Reorganization Expert are incorrect.
	F'16'	X'00000000'	Available IC or UIC is not found.
FREE	F'8'	X'0001*nnnn*'	An internal error. The parameters from IMS Database Reorganization Expert are incorrect.
		X'0002*nnnn*'	An error in IMS HP Pointer Checker FUNC=INIT. *nnnn* is the return code from IMS HP Pointer Checker.
		X'0003*nnnn*'	An error in the OS macro.

Abend codes

The following topics explain the abend codes of IMS HP Image Copy.

Because the FABJMAIN program uses the Image Copy utility of IMS, the IMS user abend codes might be issued in addition to IMS HP Image Copy abend codes. Confirm the active module name if an abend occurs during an FABJMAIN job.

IMS HP Image Copy abend codes

The following abend codes are issued by the IMS HP Image Copy function run by the FABJMAIN program.

Active module names starting with FABJ are abend codes issued by IMS HP Image Copy. FABJMAIN uses a four-digit number, 3*nnn* or 4*nnn*, to identify an abend error. It encloses this number to form a message as follows:

FABJ3*nnn*E
FABJ4*nnn*E

Image Copy function abend codes (IMS compatible JCL)

The following abend codes are issued by the Image Copy function when the function is called from IMS compatible JCL.

Active module names starting with DFSUDMP0 are abend codes issued by IMS.

There is no abend code added by the IMS HP Image Copy to the IMS Database Image Copy utility.

For an explanation of these abend codes, see the *IMS Messages and Codes*.

Recovery function abend codes (IMS compatible JCL)

The following abend codes are issued by the Recovery function when the function is called from IMS compatible JCL.

Active module names starting with DFSURDB0 are abend codes issued by IMS.

There is no abend code added by the IMS HP Image Copy to the IMS Database Recovery utility.

For an explanation of these abend codes, see the *IMS Messages and Codes*.

Checkpoint Restart function abend codes

The following abend codes are issued by the Checkpoint Restart function.

During Checkpoint Restart processing in FABJXCR, some error messages are written to DFSPRINT or SYSPRINT. If the errors are severe, IMS HP Image Copy abends with U4067 RSN=*xx*.

IMS Tools Online System Interface abend codes

The following abend codes are issued by the IMS Tools Online System Interface.

During IMS Tools Online System Interface processing in FABJTOI, FABJSTA, and FABJTOI2, some error messages are written to DFSPRINT or SYSPRINT. If the errors are severe, IMS HP Image Copy abends with U4000 RSN=*xx*. The two-digit number that is shown as RSN=*xx* corresponds the last 2 digits of FABJ46*xx*E messages. For example, if RSN=04, see the explanation of message FABJ4604E.

If IMS HP Image Copy abends with U3710, the error is in one of the TOSI API functions. See the *IMS Tools Base IMS Tools Common Services User's Guide and Reference* and look up the function (FUNC), return code (RC), and reason code (RSN) that are indicated in the error messages.

Messages

Use the information in these messages to help you diagnose and solve IMS HP Image Copy problems.

Messages that start with FABP are generated by HD Pointer Checker. Messages of HD Pointer Checker are described in the *IMS High Performance Pointer Checker User's Guide*.

Messages that start with FABA are generated by DEDB Pointer Checker. Messages of DEDB Pointer Checker are described in the *IMS Fast Path Solution Pack IMS Fast Path Basic Tools User's Guide*.

All the messages that are written to the ICEPRINT data set by IMS HP Image Copy have the following format:

FABJ*nnnnx* text
where:

FABJ

Indicates that the message was issued by IMS HP Image Copy

nnnn

Indicates the message identification number

x

Indicates the severity of the message:

A

Indicates that operator intervention is required before processing can continue.

E

Indicates that an error occurred, which might or might not require operator intervention.

I

Indicates that the message is informational only.

S

Indicates that operator intervention is required before processing can continue.

W

Indicates that the message is a warning to alert you to a possible error condition.

Each message also includes the following information:

Explanation

The Explanation section explains what the message text means, why it occurred, and what its variables represent.

System action

The System action section explains what the system will do in response to the event that triggered this message.

User response

The User response section describes whether a response is necessary, what the appropriate response is, and how the response will affect the system or program.

FABJ0001E: CONTROL STATEMENT FORMAT ERROR

Explanation

An incorrect control statement was detected during control statement syntax checking.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

See "Control statement syntax" on page 157 and correct the ICEIN control statements. Then, rerun the job.

FABJ0002E: *string* IS INVALID FOR STATEMENT NAME

Explanation

An incorrect control statement name (*string*) was detected during control statement syntax checking. A valid control statement name must be specified at this position.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

See "ICEIN control statements" on page 154 for supported statement names and specify the correct statement name. Then, rerun the job.

FABJ0003E: *keyword* KEYWORD IS INVALID FOR *statement* STATEMENT

Explanation

The indicated keyword is present on the indicated statement, but this keyword is not supported for this statement.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

See "Relation of keywords to ICEIN control statements" on page 158 for the keywords that are supported by each statement. Correct the keyword or the statement and rerun the job.

FABJ0004E: NUMBER OF *keyword* KEYWORDS EXCEEDED THE LIMIT, MAX IS *nn*

Explanation

The indicated keyword is specified more than once. The number of the indicated keywords must be less than the maximum number that is indicated in the message.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Remove some keyword entries from the ICEIN control statement so that the number of the keyword entries is less than the maximum limit. Then, rerun the job.

FABJ0005E: *keyword* KEYWORD IS REQUIRED FOR *statement* STATEMENT

Explanation

The indicated keyword must be specified for the indicated statement.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

See "Relation of keywords to ICEIN control statements" on page 158 for the required keywords for each statement. Add the required keyword and rerun the job.

FABJ0006E: NUMBER OF OPERANDS FOR *keyword* KEYWORD EXCEEDED THE LIMIT, MAX IS *nn*

Explanation

The number of the operands specified for the indicated keyword exceeds the maximum allowable number of the times. The number of the operands for the indicated keyword must be less than the maximum number that is indicated in the message.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Remove some operands that are specified for the keyword so that the number of the operands is less than the maximum limit. Then, rerun the job.

FABJ0007E: LENGTH ERROR IN *n-th* OPERAND OF KEYWORD: *keyword*

Explanation

Detected an incorrect length operand in the *n*th operand of the indicated keyword during control syntax checking.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0008E: *n-th* OPERAND IS REQUIRED FOR KEYWORD: *keyword*

Explanation

The indicated keyword requires that the *n*th operand to be specified but the operand is not specified.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

See the relevant keyword topic in "ICEIN control statement keywords" on page 158 and specify the parameter and the operand correctly. Then, rerun the job.

FABJ0010E: FORMAT OF OPERAND *nnnn* IS INCORRECT

Explanation

The dynamic allocation error reason codes (S99ERROR) and the SMS reason code (S99ERSN) must be coded in 4-digit hexadecimal number.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error in the FABJDRSN data set and rerun the job.

FABJ0012E: *keyword* KEYWORD NEEDS SINGLE QUOTATIONS ONLY AT FIRST AND LAST POSITION OF OPERAND

Explanation

The parameter specified for the indicated keyword is not enclosed by single quotation marks ('). The operand for this keyword must be enclosed in a pair of single quotation marks.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

See "ICEIN control statement keywords" on page 158 and correct the keyword or the statement and rerun the job.

FABJ0013E: THE VALUE OF *keyword* KEYWORD MUST BE SPECIFIED WITHIN 2 LINES

Explanation

The value specified for the indicated keyword must not span more than two lines.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the value for the indicated keyword and rerun the job.

FABJ0100E: ICEIN CONTROL STATEMENT ERROR

Explanation

One or more control statement errors were detected during control syntax checking.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

For details, see the associated error messages written to the ICEPRINT data set. Correct the error and rerun the job.

FABJ0101E: ANY OF GROUP/IC/AIC/CIC/ACIC/RCV/CRC STATEMENT IS REQUIRED

Explanation

No GROUP, IC, AIC, CIC, ACIC, RCV, or CRC statement was found in the ICEIN data set. At least one of them is required.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Provide the required control statement, and rerun the job.

FABJ0102E: GLOBAL STATEMENT MUST BE SPECIFIED FIRST

Explanation

The GLOBAL statement, if specified, must be specified first in the ICEIN data set.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0103E: CONFLICTING FUNCTION *fff* REQUESTED

Explanation

The specified function *fff* conflicts with a function specified in a previous statement. All the functions that are requested by the ICEIN control statements must be the same within a single FABJMAIN run.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0104E: *specification* REQUIRES DBRC

Explanation

Specification (*specification*) requires the DBRC environment.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Delete the statement with the indicated specification or specify DBRC=Y in the GLOBAL statement to activate DBRC, and rerun the job.

FABJ0105E: ICOUT=DDNAME IS NOT ALLOWED FOR *specification*

Explanation

The *specification* requires multiple output data sets to be specified. The ICOUT keyword with a specific DD name specifies only one output data set.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Change the ICOUT keyword parameter from the specific DD name to an asterisk (*) or replace the ICOUT keyword with the STACK keyword. Rerun the job. See “Relation between input and output specifications” on page 288 for more information.

FABJ0106E: ICOUT= AND STACK= ARE MUTUALLY EXCLUSIVE

Explanation

Both the ICOUT keyword and the STACK keyword are specified in a control statement, but they are mutually exclusive.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Remove the unused keyword, and rerun the job.

FABJ0107E: EITHER ICOUT= OR STACK= IS REQUIRED FOR *statement* STATEMENT

Explanation

The ICOUT keyword or the STACK keyword is not specified on the *statement* control statement. The statement requires one of them.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Add either the ICOUT or the STACK keyword to the indicated control statement, and rerun the job.

FABJ0108E: EITHER AREA= OR DDN= IS REQUIRED FOR RCV STATEMENT

Explanation

The AREA or the DDN keyword is not specified in the RCV control statement. The statement requires one of them.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Add either the AREA or the DDN keyword, corresponding to the type of database, to the control statement, and rerun the job.

FABJ0109E: EXPDT= AND RETPD= ARE MUTUALLY EXCLUSIVE

Explanation

Both the EXPDT=(or EXPDT2=) and the RETPD=(or RETPD2=) parameters are specified in a control statement, but they are mutually exclusive.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Remove the unused parameter, and rerun the job.

FABJ0110E: THE NUMBER OF SPECIFIED GROUP/IC/AIC/CIC/ACIC/CRC STATEMENTS IN ICEIN DD EXCEEDS 2048

Explanation

The total number of GROUP, IC, AIC, CIC, ACIC, and CRC statements in the ICEIN data set exceeds 2048. The maximum allowable number for these statements is 2048.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Divide the job step into multiple job steps and ensure that the number of statements in each job step is less than the maximum number allowed. Rerun the job.

FABJ0111E: DBDSGRP= AND CAGRP= ARE MUTUALLY EXCLUSIVE

Explanation

Both the DBDSGRP and the CAGRP keywords are specified in a control statement, but they are mutually exclusive.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Remove the unused keyword, and rerun the job.

FABJ0112E: INVALID FUNCTION *function* REQUESTED

Explanation

An incorrect function *function* was detected during control statement syntax checking. The parameter of the FUNC keyword must be IC, CIC, AIC, ACIC, or CRC.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

See "FUNC keyword" on page 192 and specify a valid function. Then, rerun the job.

FABJ0113E: EITHER DBDSGRP= OR CAGRP= IS REQUIRED FOR GROUP STATEMENT

Explanation

The DBDSGRP or the CAGRP keyword is not specified in the GROUP control statement. The statement requires either of these keywords.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Add either the DBDSGRP or the CAGRP keyword to the control statement, and rerun the job.

FABJ0114E: INVALID OPERAND FOR *keyword* KEYWORD

Explanation

An incorrect operand was found in the *keyword* keyword.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0115E: MORE THAN ONE *statement* STATEMENT SPECIFIED

Explanation

More than one *statement* statement found in the ICEIN control statement. Only one *statement* statement can exist in one ICEIN control statement.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0117E: INVALID EXPDT= SPECIFIED: CODE=*nnnn*

Explanation

The value specified for the EXPDT keyword (*nnnn*) is invalid.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0118E: HPIC COULD NOT GENERATE THE OUTPUT DATA SET NAME THAT WAS SPECIFIED BY THE *keyword* KEYWORD

DBD=*dbdname* DDN=*ddname*

Explanation

The output data set name that was specified by the indicated keyword could not be generated.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Ensure that the symbolic parameter specification of the keyword is correct. Correct the specification and rerun the job.

FABJ0119W: ICHLQ= WAS IGNORED BECAUSE DSNAME IS LONGER THAN 44 BYTES (DBD=*dbdname*, DD/AREA=*ddname*, ICDS=*dsname*)

Explanation

The value specified for ICHLQ is ignored because the length of the IC data set name generated is longer than 44 bytes.

System action

Program FABJMAIN does not use the value of ICHLQ and continues the process.

User response

If necessary, correct the error and rerun the job.

FABJ0120E: *nnnnnnnn* IS SPECIFIED AFTER &GDG VARIABLE

Explanation

Symbolic variables, non-variable characters *nnnnnnnn* are specified after variable &GDG. However, if you use Generation Dataset Groups, &GDG is required at the last position of the template. &GDG is an identifier of Generation Dataset Groups and is the position of absolute generation and version numbers in the data set name.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template and rerun the job.

FABJ0121E: INVALID SYMBOLIC VARIABLE *&nnnnnnnn* IS FOUND

Explanation

An incorrect symbolic variable *&nnnnnnnn* is found in the template.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template and rerun the job.

FABJ0122E: SAME DATASET NAME FOR OUTPUT IC

Explanation

The same data set naming template was specified.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template and rerun the job.

FABJ0123E: *keyword1* KEYWORD SPECIFIED WITHOUT *keyword2* KEYWORD

Explanation

When the keyword *keyword1* is specified, the keyword *keyword2* must also be specified.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the keywords and rerun the job.

FABJ0124E: NOT ALLOWED TO SPECIFY ICHLQ2= AND ICHLQ=(HLQ,HLQ2) AT THE SAME TIME

Explanation

Both ICHLQ2 and ICHLQ=(*hlq1,hlq2)* are specified. The keyword ICHLQ2 and the second parameter of ICHLQ, which is for the secondary IC, cannot be specified together.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the keyword and rerun the job.

FABJ0125E: REQUIRED TO CREATE SECONDARY IMAGE COPY, BUT DSN2= KEYWORD IS NOT SPECIFIED

Explanation

Template (DSN2) for secondary image copy data set is not specified when the template DSN is specified, and creation of a secondary IC is requested.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Specify a DSN2 template and rerun the job.

FABJ0126E: DSNAME CREATED BY DSN= OR DSN2= KEYWORD HAS MORE THAN 44 CHARACTERS

Explanation

The data set name that is created by the template exceeds the limit, which is 44 characters.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template and rerun the job.

FABJ0127E: TIME RELATED SYMBOLIC IS SPECIFIED WITH &GDG SYMBOLIC

Explanation

A time- or date-related symbolic parameter is specified with &GDG.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template and rerun the job.

FABJ0129E: GDG BASE NOT FOUND. LOCATE MACRO ERROR RC=*xx*

Explanation

A symbolic parameter &GDG is specified, but a generation data group base entry was not found by the LOCATE macro.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Check the return code of the LOCATE macro by referring to the *DFP System Program Reference*, correct the error, and rerun the job.

FABJ0130E: INCORRECT USE OF PERIOD IS FOUND

Explanation

Continuing periods are found in the image copy data set name, or the first character of the image copy data set name is a period.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template or ICHLQ and rerun the job.

FABJ0131E: NON-ALPHA-NUMERIC CHARACTER IS FOUND

Explanation

A character that cannot be used for a data set name is specified in the template or ICHLQ keyword.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template or ICHLQ and rerun the job.

FABJ0132E: FIRST CHARACTER IS NOT ALPHABETIC

Explanation

The first character in the qualifier of the image copy data set is not an alphabetic character.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template or ICHLQ and rerun the job.

FABJ0133E: QUALIFIER LENGTH IS GREATER THAN 8 BYTES

Explanation

The length of the qualifier in the image copy data set name is longer than 8 characters.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the template or ICHLQ and rerun the job.

FABJ0134W: KEYWORD *keyword* IS IGNORED

Explanation

Keyword *keyword* is specified in the GLOBAL statement for program FABJTGEN, but this keyword is not supported for site default. FABJTGEN ignores this keyword.

System action

FABJTGEN continues processing.

User response

Specify keyword *keyword* in the GLOBAL statement of the FABJMAIN JCL at run time.

FABJ0135E: NO KEYWORD FOR GENERATING OF THE SITE DEFAULT TABLE

Explanation

No valid keyword is found in the GLOBAL statement of program FABJTGEN.

System action

Program FABJTGEN stops processing with a return code of 8.

User response

Check the keywords in the GLOBAL statement, correct them, and rerun the job.

FABJ0136E: GLOBAL STATEMENT NOT FOUND

Explanation

There is no GLOBAL statement in the ICEIN control statement of program FABJTGEN.

System action

Program FABJTGEN stops processing with a return code of 8.

User response

Check ICEIN control statements, correct them, and rerun the job.

FABJ0137I: SITE DEFAULT TABLE IS USED [AS GLOBAL STATEMENT]

Explanation

The site default values that are defined in the site default table are applied to this run. If EXEC PGM=FABPMAIN, the default values are applied as the GLOBAL statement values.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0138W: NO VALID IMAGE COPY REGISTERED WITH DBRC TO CREATE IC RC=04

Explanation

No valid image copy data set is registered with the DBRC for the database.

System action

Program FABJMAIN continues processing with a return code of 4.

User response

None.

FABJ0139I: CRCTYPE=L IS IGNORED. CRC PROCESSES AS PHYSICAL COPY

Explanation

CRCTYPE=L is specified in a control statement but is ignored, and CRC is run with physical copy process for one of the following reasons:

- An input image copy data set is either an IC2 image copy or an online image copy.
- An input image copy data set is compressed by the same routine as the data set specified.
- COMP=N is specified for a non-compressed input image copy data set.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0140E: *xxxxxxxxxxxxxxxx* OF INPUT IMAGE COPY IS DIFFERENT FROM DBRC RECORD.

Explanation

The Create Image Copy function compared *xxxxxxxxxxxxxxxx* in the header record of the image copy data set with the one in the DBRC record, and found a discrepancy.

System action

Program FABJMAIN stops processing with a return code of 8.

User response

Make sure the input image copy data set is correct, and rerun the job.

FABJ0141W: DBRC=Y CONFLICTS WITH A CONDITION OF INPUT IMAGE COPY DATASET

Explanation

Both the ICDUMP and the DBRC=Y parameters are specified in a control statement, with the result that the NOTIFY.IC process was bypassed.

System action

IMS HP Image Copy continues processing.

User response

None.

FABJ0142E: NO IMAGE COPY REGISTERED WITH DBRC TO CREATE IMAGE COPY

Explanation

No image copy data set is registered with the DBRC for the database or all databases of a database group.

System action

Program FABJMAIN stops processing with a return code of 8.

User response

Correct the error and rerun the job.

FABJ0143I: CREATE IMAGE COPY IS NOTIFIED AS SECONDARY IMAGE COPY

Explanation

Only the primary image copy is registered to DBRC, and the creation of image copy is notified as the secondary image copy.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0144I: PRIMARY IMAGE COPY IS REPLACED BY CREATE IMAGE COPY

Explanation

The primary image copy has an error, and so the primary image copy is replaced by the create image copy.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0145I: SECONDARY IMAGE COPY IS REPLACED BY CREATE IMAGE COPY

Explanation

The secondary image copy has an error, and so the secondary image copy is replaced by the create image copy.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0146I: CREATE IMAGE COPY PROCESS START DB NAME=*dbdname* DD/AREA NAME=*ddname* GROUP NAME=*grpname*

Explanation

The create image copy process started for the indicated resource.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0147I: CREATE IMAGE COPY COMPLETED RC=*nn*

Explanation

The create image copy process completed with a return code of *nn*.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0148E: *xxxxxxxxxxxxxx* OF CRC STATEMENT IS UNMATCHED IN INPUT IMAGE COPY HEADER RECORD

Explanation

The Create Image Copy function compared the DBD name, the DD name, and the AREA name in the header record of the image copy data set with those in the CRC statement parameters, and found a discrepancy. *xxxxxxxxxxxxxx* shows the name of the DBD, DD, or area that contains this discrepancy.

System action

Program FABJMAIN stops processing with a return code of 8.

User response

Check the input image copy data set and rerun the job.

FABJ0149E: INPUT IMAGE COPY IS NOT VALID FOR THE HPIC CREATE IMAGE COPY FUNCTION

Explanation

The input image copy is invalid. The input image copy data set must be one of the following image copies:

- Batch image copy
- Concurrent image copy
- Online database image copy
- Database image copy 2

System action

Program FABJMAIN stops processing with a return code of 8.

User response

Check the input image copy data set and rerun the job.

FABJ0150I: NOTIFY.IC PROCESS IS BYPASSED

Explanation

Because both the primary image copy and the secondary image copy are already registered to DBRC, the NOTIFY.IC process is bypassed.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0151E: REGISTERED IMAGE COPY IS IDENTIFIED AS ERROR IN RECON. IC=*primary IC data set name* TIMESTMP=*timestamp*

Explanation

The input image copy data set could not be used for one of the following reasons:

- Only the primary data set is registered, but the IC contains an error.
- Both the primary and the secondary data sets contain errors.

System action

Program FABJMAIN stops processing with a return code of 8.

User response

Correct the error and rerun the job.

FABJ0155I: GROUP NAME=*name* PROCESSES AS A SINGLE TASK

Explanation

FUNC=AIC or ACIC and STACK=*ddname* is required for a GROUP statement. IMS HP Image Copy processes the GROUP as a single task.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0156E: DD=*ddname* IS RESERVED BY HPIC

Explanation

DD=*ddname*, which is found in the JCL stream, is reserved for use by IMS HP Image Copy for dynamic allocation.

System action

When the reported DD is FABJDFSP and message FABJ0237W is also issued, IMS HP Image Copy continues processing without storing the IMS HP Image Copy Processing Messages report in the IMS Tools KB Output repository. Otherwise, program FABJMAIN stops processing with a return code of 8.

User response

Change the DD name in the JCL stream and rerun the job.

FABJ0157W: MODULE *module_name* NOT FOUND. *process_name* IS BYPASSED

Explanation

Because IMS HP Image Copy could not load the required module in the specified libraries, the requested processing was bypassed.

System action

IMS HP Image Copy continues processing with a return code of 4.

User response

Ensure that a valid library that contains the required module for the processing is specified. If the problem persists, contact IBM® Software Support.

FABJ0158W: HDPC HASH CHECK IS BYPASSED

Explanation

HD Pointer Checker HASH Check was requested, but it was not performed for one of the following reasons:

- The correct HD Pointer Checker HASH Check module was not found.
- The processed tasks for the full-function database exceeded 99 tasks.

System action

Program FABJMAIN continues processing without HD Pointer Checker HASH Check. The return code of the process is 04.

User response

If necessary, correct the error and rerun the job.

FABJ0159E: ATTACHED SUBTASKS EXCEEDED THE MAXIMUM

Explanation

The requested number of parallel tasks is more than 254.

System action

Program FABJMAIN stops processing with a return code of 8.

User response

Control the number of parallel tasks and rerun the job.

FABJ0160W: IMAGE COPY PROCESS IS CONTINUED

Explanation

IMS HP Image Copy detected an error in the image copy process for the primary image copy or the secondary image copy. Only one of the processes will be continued.

System action

If either one of the processes has no errors, that process is continued.

User response

The error reason is described in corresponding messages FABJ0161W or FABJ0162W.

FABJ0161W: I/O ERROR OCCURS FOR IC DATA SET DDNAME=*XXXXXXXX* OF DBD=*XXXXXXXX*, DDN=*XXXXXXXX*

Explanation

An I/O error is detected in either the primary or the secondary image copy process.

System action

The image copy process continues processing with a return code of 4.

User response

None.

FABJ0162W: DD DUMMY IS SPECIFIED FOR IC DATA SET DDNAME=*XXXXXXXX* OF DBD=*XXXXXXXX*, DDN=*XXXXXXXX*

Explanation

The dummy data set is specified as the secondary IC data set.

System action

IMS HP Image Copy continues processing with a return code of 4.

User response

None.

FABJ0163E: FORMAT OF INPUT DBDS IS NOT SUITABLE FOR DFSMSDSS ADVANCED IMAGE COPY SERVICES

Explanation

Because the database data set will cause errors in DFSMSdss Advanced Copy Services, IMS HP Image Copy rejected the data set. Errors can be, for example:

- Specifying invalid volume information for the input DBDS can be a cause of an error.
- A multiple-volume data set of OSAM that is allocated by using a separate IEFBR14 utility step for each volume can cause an error.

System action

IMS HP Image Copy stops processing with a return code of 8.

User response

Correct the error and rerun the job.

FABJ0164E: UNSUPPORTED LEVEL OF *product* IS BEING USED.

Explanation

The level of the prerequisite product (*product*) is not supported by this release of IMS HP Image Copy. *product* shows either of the following products:

- IMS HP POINTER CHECKER
- IMS HP FP UTILITIES

System action

Program FABJMAIN stops processing with a return code of 8.

User response

To run this job, ensure that the prerequisite product is at a compatible release level.

FABJ0165E: DDNAME: *icddn* OF IMAGE COPY DATA SET FOR DBD *dbdname* DDN/AREA [*ddname* | *areaname*] IS NOT FOUND.

Explanation

The *icddn* DD of image copy data set is not found in the JCL stream.

System action

The image copy process fails.

User response

Provide the DD statement that corresponds to the DD name specified on the ICOUT keyword. Then, rerun the job.

FABJ0166E: REUSE OF THE IMAGE COPY DATA SET IS NOT ALLOWED FOR THE FOLLOWING DATABASE DATA SETS.

Explanation

Because NOREUSE=Y is specified, IMS HP Image Copy tried to dynamically allocate the output image copy data set. However, the name of the output image copy data set that IMS HP Image Copy tried to dynamically allocate is already cataloged in the system. IMS HP Image Copy does not process the database data set. The names of the database and image copy data sets are reported in subsequent FABJ0167E messages.

System action

IMS HP Image Copy processing ends with a return code of 8.

User response

Change the data set naming template of the image copy data set and rerun the job.

FABJ0167E: DBD=*dbdname* DDN/AREA=*ddname* ICDSN=*data_set_name*

Explanation

This message follows message FABJ0166E.

System action

See the explanation of message FABJ0166E.

User response

See the explanation of message FABJ0166E.

FABJ0168I: DEL_ICDS=Y IS APPLIED TO ICDS OF DBD=*dbdname* DDNAME/AREA=*ddname*

Explanation

The DEL_ICDS=Y option, which deletes the image copy data set when errors occur in the process, is applied in the create image copy process. The image copy data set of the indicated database data set will be deleted.

System action

The create image copy processing continues.

User response

None. This message is informational.

FABJ0169E: DEL_ICDS=Y IS APPLIED TO ICDS OF DBD=*dbdname* DDNAME/AREA=*ddname*, BUT FOLLOWING DELETE PROCESS HAS NOT COMPLETED.

delete_process

Explanation

The delete process of the Image Copy function or the Create Image Copy function detected errors in the IDCAMS or the DSPURXRT process. *delete_process* shows one of the following processes:

- DELETE DBRC IC RECORD
- UNCATALOG
- DELETE ICDS
- CHANGE DBDS STATUS TO IC NEEDED

The following FABJ0169E messages follow this message:

```
FABJ0169E ICDSN=data_set_name VOLSER=volser
FABJ0169E DBRC ICTIME=[yyyydddhhmmssthmiju offset|
          yydddhhmmsst offset]
```

System action

Processing ends with a return code of 8.

User response

Locate the IDCAMS or DSPURXRT messages, correct any errors, and delete the resource manually.

FABJ0170E: THE DATA SET IS SYSIN, SYSOUT, OR SUBSYSTEM (SUBSYS=). IT IS NOT A SUPPORTED [INPUT | OUTPUT] DATA.

Explanation

The input or output image copy data set is defined as SYSIN, SYSOUT, or subsystem. It is not a data set supported as an image copy data set.

System action

The Image Copy function ends with a return code of 16. The Recovery function issues message DFS301A and ends with a return code of 8.

User response

Verify the input image copy data.

FABJ0171E: UNABLE TO OPEN IMAGE COPY DATASET, BECAUSE THE PRIMARY SPACE FOR IMAGE COPY DATASET IS ZERO.

Explanation

The primary space parameter of output image copy data set is zero.

System action

The Image Copy function ends with a return code of 8.

User response

Verify the SMS definition or specify a correct space parameter and rerun the job.

FABJ0172E: THE EXTENT NUMBER OF OSAM EXCEEDS THE LIMIT NUMBER

Explanation

The number of extents of the OSAM data set is larger than the number that you specified for EXTENT.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Check the SPACE parameter in the allocation information of the OSAM data set, and increase the allocation size of the secondary definition if necessary. Rerun the job.

FABJ0173E: VIC=Y AND HDPC=O ARE MUTUALLY EXCLUSIVE

Explanation

Both VIC=Y and HDPC=O are specified in a control statement, but they are mutually exclusive.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Remove the parameter that is not needed, and rerun the job.

FABJ0174I: VIRTUAL IMAGE COPY PROCESS IS APPLIED

Explanation

The virtual image copy process is applied for primary and secondary indexes database.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0175I: HD POINTER CHECKER IS PROCESSED WITHOUT CREATING OUTPUT IMAGE COPY

Explanation

HD Pointer Checker HASH Check is done without creating an output image copy for the primary index database.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0176I: VIRTUAL IMAGE COPY PROCESS IS NOTIFYING DUMMY DATA SET NAME TO DBRC DBD=*dbdname* DDN=*ddname*

Explanation

The virtual image copy process notifies DBRC that the dummy data set name was registered as a UIC record.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0177E: NOTIFY.UIC PROCESS FAILED DBD=*dbdname* DDN=*ddname*

Explanation

The NOTIFY.UIC process failed. The dummy data set name is not registered in DBRC.

System action

The Image Copy function ends with a return code of 8.

User response

Check the DBD and the DD name, and rerun the job.

FABJ0178E: *mac-name* ERROR item=*item-name* RC=*nnnnnnnn* REASON=*nnnnnnnn*

Explanation

The *mac-name* macro for getting *item-name* failed.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Contact IBM® Software Support.

FABJ0179E: EXTENT LIMIT CHECK PROCESS FAILED RC=*nnnnnnnn*

Explanation

An incorrect DD name was passed to the EXTENT limit check process.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Check and correct the DD name of the recovered DB. Then, rerun the job.

FABJ0180I: INDEX DB IC MAY NOT BE ABLE TO RECOVER BECAUSE OF THE CIC PROCESS

Explanation

IMS HP Image Copy provides the capability to create concurrent image copies for KSDS index databases. These image copies can be used for data pointer checking or for user-specific purposes. However, when you use these image copies to recover an index database, the database might not be recovered correctly. This message is not shown when VIC=Y is specified.

System action

Program FABJDPS*n* continues processing.

User response

None. This message is informational.

FABJ0181E: DUPLICATE DBDS IS SPECIFIED ON PREVIOUS STATEMENT

Explanation

The same DBDS is specified in the IC, the AIC, or both statements of the ICEIN DD statement.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0182E: SPECIFIED DD STATEMENT FOR ICDS IS NOT SUPPORTED : DDN *ddname*

Explanation

The specification, *ddname*, on the DD statement for the image copy data set is not supported.

System action

IMS HP Image Copy stops processing with a return code of 16.

User response

If you receive this message for the DD statement for the image copy data set of secondary index database, do as follows:

- If you are running IMS Database Reorganization Expert job step that uses Type-A image copy, remove the DD statement for the image copy data set from the JCL statement to use dynamic allocation or change the DD statement to specify an image copy data set on DASD. Then, rerun the job.
- Otherwise, remove the DD statement for the image copy data set from the JCL statement to use dynamic allocation. Then, rerun the job.

FABJ0183I: CONCURRENT IMAGE COPY FOR A NON-RECOVERABLE DATASET DOES NOT CREATE AN IMAGE COPY DATA SET

Explanation

IMS HP Image Copy concurrent image copy process has not created an output image copy data set for the non-recoverable database.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0184I: HD POINTER CHECKER IS NOT PERFORMED, HOWEVER HDPC=O IS REQUESTED.

Explanation

HD Pointer Checker HASH Check is requested without creating an output image copy for the primary or the secondary index database. But HD Pointer Checker HASH Check is not done because a correct HD Pointer Checker library is not provided in STEPLIB.

System action

Program FABJMAIN continues processing without HD Pointer Checker HASH Check. The return code of the process is 04.

User response

If necessary, provide the correct IMS HP Pointer Checker library in the STEPLIB and rerun the job.

FABJ0185E: THE DBDS IS NOT PROCEEDED DUE TO INDEX BUILDER ERROR

Explanation

The IMS HP Image Copy process for the secondary index database is not proceeded due to the error of Index Builder.

System action

IMS HP Image Copy continues processing and returns control to the IPR Driver or the Smart Reorg utility with return code 8, and reason code 00030010.

User response

Check the error reason of the Index Builder process. If necessary, correct the error and rerun the job.

FABJ0186I: WAITALOC=Y WAS IGNORED. HPIC RUNS AS AN UNAUTHORIZED PROGRAM.

Explanation

WAITALOC=Y was ignored because IMS HP Image Copy runs as an unauthorized program.

System action

Program FABJMAIN continues processing. IMS HP Image Copy does not wait when the requested device is in use.

User response

Check that the APF-authorized library list contains all libraries that are concatenated to STEPLIB.

FABJ0187E: *cccc* IS INVALID KEYWORD/OPERAND FOR THE CONCURRENT IMAGE COPY FUNCTION

Explanation

Incorrect keyword is specified for the concurrent image copy function.

System action

IMS HP Image Copy ends with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0188I: RETURN CODE OF HPPC WILL NOT BE CHANGED. BECAUSE HPPC MAINTENANCE LEVEL IS LOW.

Explanation

The return code change function for IMS HP Pointer Checker is ignored because the maintenance level of IMS HP Pointer Checker is low and does not support the return code change function for the HASH Check option under IMS HP Image Copy.

System action

Program FABJMAIN continues processing.

User response

Use the supported version of IMS HP Pointer Checker, and rerun the job.

FABJ0189E: FORMAT OF IMAGE COPY DATA SET IS INCONSISTENT WITH FORMAT INFORMATION IN RECON.

Explanation

The format of the input image copy data set is inconsistent with the IC format information in RECON.

System action

IMS HP Image Copy ends the job with return code 8.

User response

Check the input image copy data set and rerun the job.

FABJ0190I: INDEX DBDS DBD=*dbdname* DDN=*ddname* IS FOUND, VIRTUAL IMAGE COPY PROCESS APPLIED.

Explanation

A related index DBDS is found. The virtual image copy process is applied to the DBDS.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0191I: GROUP MEMBER DBD=*dbdname* IN GROUP NAME=*grpname* IS NOT REGISTERED WITH DBRC

Explanation

A member of DBD *dbdname* in a group named *grpname* is not registered with DBRC.

> **Note:** If you use the database group type of the DBDS group, consider that a database group must specify the DBD name or the partition name of the HALDB that is registered in DBRC. When a database group indicates the area name, IMS HP Image Copy ignores it.

System action

Program FABJMAIN ignores the member and continues processing.

User response

None. This message is informational.

FABJ0192E: IMAGE COPY FOR DBD=*dbdname* DDN=*ddname* IS NOT PROCESSED.

Explanation

The Image Copy function does not process because an error occurred in IMS Database Recovery Facility processing.

System action

Image Copy function continues processing.

User response

None.

FABJ0193E: EMPTY DATABASE DATA SET IS NOT SUPPORTED IN FASTIC=(,COPY) PROCESS.

Explanation

The input database data set is empty. An empty database data set is not supported in the FASTIC=(,COPY) process.

System action

IMS HP Image Copy processing ends a job with return code 8.

User response

Check the input database data set and rerun the job.

FABJ0194I: DATABASE LOGICAL GROUP MEMBER DBD=*dbdname* DDN=*ddname* IS FOUND, IMAGE COPY PROCESS APPLIED.

Explanation

The logical group DBDS is found. The Image Copy function is processed for this DBDS.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0195W: DBD *dbdname* NOT FOUND IN DBDLIB. IMAGE COPY PROCESS IS BYPASSED.

Explanation

The logical group DBDS is found. But the DBD member of this DBDS was not found in the DBD library that is specified by the IMS DD statement in the JCL. The Image Copy function is not processed for this DBDS.

System action

Program FABJMAIN continues processing without this database. The return code of the process is 04.

User response

Make sure that the correct DBD library is specified for the IMS DD statement.

FABJ0196W: DBALL=Y IS IGNORED BECAUSE OF HPPC CONDITION.

Explanation

Keyword DBALL=Y is specified in the ICEIN control statement but it was ignored for one of the following reasons:

- The version and release of the IMS HP Pointer Checker library is not supported.
- IMS HP Pointer Checker library is not found.

System action

Program FABJMAIN continues processing without the logical group search. The return code of the process is 04.

User response

If necessary, correct the error and rerun the job.

FABJ0197E: DUPLICATE OPERAND FOR $ KEYWORD

Explanation

A keyword where each operand must be unique is duplicated.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0198I: INPUT DATA SET NOT FOUND IN CATALOG. DYNALLOC IS RETRIED WITH VOLSER AND UNIT INFORMATION IN DBRC

Explanation

Dynamic allocation is retried with VOLSER and UNIT information from image copy record in the RECON data set because CATDS of DBRC is enabled but image copy data set is not cataloged.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0199E: *mmmmmmmm* AND *nnnnnnnn* ARE MUTUALLY EXCLUSIVE

Explanation

Both parameters are specified in a control statement, but they are mutually exclusive.

System action

IMS HP Image Copy stops processing with a return code of 16.

User response

Remove the unused parameter, and rerun the job.

FABJ0201I: IMSPLEX= KEYWORD IS IGNORED

Explanation

The IMSPLEX parameter keyword specified in ICEIN is ignored. It is not supported as an ICEIN keyword.

System action

IMS HP Image Copy continues processing.

User response

If necessary, change the specification of the IMSPLEX parameter keyword specified to the EXEC parameter, and rerun the job.

FABJ0202I: DYNAMIC ALLOCATION FAILURE OCCURRED FOR DD: *dddddddd* RC=*rrrr* RSN=*eeee iiii zzzz*

Explanation

An attempt to dynamically allocate the RECON data set whose DD name *dddddddd* failed. IMS HP Image Copy continues processing by using other RECON data sets that were allocated successfully.

rrrr

Indicates the return code from SVC99.

eeee

Indicates the S99 ERROR contents.

iiii

Indicates the S99 INFO contents.

zzzz

Indicates the S99 ERSN contents.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0203I: DSN: *data_set_name* DISP: *cccc*

Explanation

This message displays supplemental information for the message, which appears before this one.

System action

Not applicable.

User response

None. This message is informational.

FABJ0204I: INPUT IMAGE COPY IS NOTIFIED AS PRIMARY IMAGE COPY, AND CREATE IMAGE COPY IS NOTIFIED AS SECONDARY IMAGE COPY

Explanation

The Create Image Copy function issues the NOTIFY.IC command. This command registers the input image copy data set to RECON as a primary image copy data set and registers the primary output image copy data set to RECON as a secondary image copy data set.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0205I: THE IMAGE COPY STATUS IN THE RECON IS CHANGED TO IC NEEDED DDNAME/AREA=*ddname*

Explanation

The Image Copy function or the Create Image Copy function issued the CHANGE.DBDS command to prevent the image copy status of the database data set from being changed to IC RECOMMENDED.

- For the Image Copy function, this command is issued after the DELETE.IC or DELETE.UIC command.
- For the Create Image Copy function, this command is issued after the NOTIFY.IC command.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0206W: NOTIFY.IC PROCESS IS BYPASSED BECAUSE OF MISMATCHES BETWEEN INPUT IMAGE COPY AND DBRC

Explanation

The Create Image Copy function bypasses the NOTIFY.IC process for one of the following reasons:

- The image copy record is already registered in DBRC but the image copy type does not match the input image copy data set.
- The image copy record is already registered in DBRC but the run time does not match the input image copy data set.
- The image copy record is not registered in DBRC and the input image copy type is not BATCH.

System action

IMS HP Image Copy continues processing.

User response

None.

FABJ0207I: THE TYPE OF IMAGE COPY IS CHANGED *xxxxxxxx* INTO *yyyyyyyy*

Explanation

The Create Image Copy function issues the DELETE.IC and the NOTIFY.IC commands. These commands change the image copy type of the existing image copy record in DBRC from *xxxxxxxx* to *yyyyyyyy*.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0208E: 1ST OPERAND VALUE OF THE SYMBOLIC VARIABLE *&$$$$(n,l)* EXCEEDS *$$$$* NAME LENGTH

Explanation

The value exceeds the length of the *$$$$* name, which is specified in the first operand of the symbolic variable *&$$$$(n,l)*.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0209E: NTH OPERAND VARIABLE IS REGARDED AS INCORRECT FOR SYMBOLIC PARAMETER

Explanation

An incorrect value was found in the subparameter of a symbolic parameter. If an error was detected in the second operand, the value exceeds the range of the specification, or the extracted strings exceeded the maximum length for the name.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0210E: DBD=*dbdname*,DD/AREA=*ddname*,DSN*x*

Explanation

The information of the same data set naming template was specified.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0211I: IMAGE COPY RECORD IS NOT REGISTERED TO DBRC RECON DATA SET

Explanation

The image copy information for this database data set is not registered to the DBRC RECON data set.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0212I: KEYWORD NOTIFYMODE= WAS IGNORED BECAUSE DBRC=N WAS SPECIFIED.

Explanation

The NOTIFYMODE keyword was ignored because the DBRC=N keyword was specified.

System action

IMS HP Image Copy continues processing, but IMS HP Image Copy does not register any image copy data sets to the DBRC RECON data sets.

User response

If you want to register the output image copy data set to the DBRC RECON data sets, specify the DBRC=Y keyword.

FABJ0213I: ONE OR TWO OUTPUT IMAGE COPY DATA SETS WERE REGISTERED TO THE RECON DATA SETS FOR DBD=*dbdname* [DDN | AREA]=[*ddname* | *areaname*]

Explanation

The DBRC RECON data sets were successfully updated. The primary output image copy data set was registered as a primary image copy record in RECON. If the secondary image copy data set was created, it was registered as a secondary image copy record in RECON.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0214I: NOTIFY.IC DBRC COMMAND WAS BYPASSED FOR DBD=*dbdname* [DDN | AREA]=[*ddname* | *areaname*]

Explanation

The registration process of the output image copy data sets was bypassed because this database data set is not registered in RECON.

System action

IMS HP Image Copy continues processing. The return code of the process is 00.

User response

If you want to register the output image copy data set to the DBRC RECON data sets, register this database to DBRC.

FABJ0215E: NOTIFY.IC DBRC COMMAND WAS BYPASSED FOR DBD=*dbdname* [DDN | AREA]=[*ddname* | *areaname*]

Explanation

Image copy processing, run with the NOTIFYMODE=COND keyword, bypassed the registration process of the output image copy data sets because of one of the following reasons:

- Database errors were detected while HASH Check was being run.
- Some errors occurred while creating output image copy data sets.
- The Checkpoint Restart function determined this database data set as the database data set that is to be reprocessed in the next run.

System action

IMS HP Image Copy continues processing without this database data set. The return code of the process is 08.

User response

Locate other error messages and correct the error.

FABJ0216W: DATABASE *dbname* WAS NOT REGISTERED WITH DBRC.

Explanation

The database record or the database data set record was not registered to RECON.

System action

IMS HP Image Copy continues processing without registration process of the output image copy data sets. The return code of the process is 00.

User response

If you want to register the output image copy data set to the DBRC RECON data sets, register this database to DBRC manually.

FABJ0217I: NO DATABASE ERRORS WERE DETECTED DURING THE HASH CHECK OF [*dbname* DATABASE | *areaname* DEDB AREA | *partname* PARTITION DATABASE].

Explanation

HD Pointer Checker HASH Check or DEDB Pointer Checker HASH Check ended normally.

System action

IMS HP Image Copy continues processing.

User response

None. If you have not specified the TOIAUTO=Y or TOIAUTO_Q=Y option, you can safely start the database or release quiesce of the database after this message.

FABJ0218I: THE DATABASE ERRORS WERE DETECTED DURING THE HASH CHECK OF [*dbname* DATABASE | *areaname* DEDB AREA | *partname* PARTITION DATABASE].

Explanation

Database errors were detected while HD Pointer Checker HASH Check or DEDB Pointer Checker HASH Check was being run.

System action

IMS HP Image Copy continues processing if the NOTIFYMODE=FORCE keyword is specified. If the NOTIFYMODE=COND keyword is specified, IMS HP Image Copy continues processing, but does not register the output image copy data sets to the DBRC RECON data sets.

User response

Determine the cause of the database errors by reviewing HD Pointer Checker reports or DEDB Pointer Checker reports. If necessary, repair the database.

FABJ0219I: PROCESS FOR [DBD=*dbdname* DDN=*ddname* | DBD=*masterdbdname* PART=*partname* DDN=*ddname* | DBD=*dbdname* AREA=*areaname*] IS BYPASSED BECAUSE A FOUND ENTRY IN RECON IS UIC

Explanation

The indicated resource is registered as UIC in the RECON data sets. IMS HP Image Copy skips the create image copy process for this resource.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0220W: THE ACCESS TO OUTPUT REPOSITORY WAS CANCELED REASON: *reason*

Explanation

IMS HP Image Copy canceled its access to the IMS Tools KB Output repository because the initialization process failed. The reason is one of the following:

- Dynamic allocation of the library in the ITKBLOAD parameter failed
- Failed to open the library specified on the ITKBLOAD parameter
- Failed to load the HKTXXLI module

System action

Processing continues, but IMS HP Image Copy does not store any reports to the IMS Tools KB Output repository.

User response

If you want to store the reports to the IMS Tools KB Output repository, specify the correct load module library of the IMS Tools KB product.

Problem determination

Check the following to see if the IMS Tools KB product load module library name is correct:

- The specification of the ITKBLOAD parameter on the PROC statement in the PROCCTL data set
- STEPLIB, JOBLIB, or LINKLIST concatenations

FABJ0221W: ERROR OCCURRED IN ACCESSING OUTPUT REPOSITORY FUNC: *function* RC: *rc* RSN: *rsn*

Explanation

An error occurred while getting access to the IMS Tools KB Output repository.

System action

Processing continues. If the return code is equal to or greater than 08, IMS HP Image Copy does not store its reports to the IMS Tools KB Output repository.

User response

If you want to store the reports to the IMS Tools KB Output repository, correct the error.

If you receive this message in an IMS Online Reorganization Facility job, ensure that the server name is specified correctly. If the processed database is a HALDB, ensure that the ITKBSERVER keyword is specified in the HRFSYSIN DD of IMS Online Reorganization Facility.

Problem determination

If any of the messages, FABJ0227W, FABJ0228W, FABJ0229W, or FABJ0230W, which describes the cause of the error, is issued following this message, see the explanation for those messages. If those messages are not issued, check the return code and the reason code shown in this message. The codes are in hexadecimal. For the description of the return code and reason code, see the *IMS Tools Base IMS Tools Knowledge Base User's Guide and Reference*.

FABJ0222W: DBD: *dbdname* [PART: *partname*] DD: *ddname* REPORT: *report name*

Explanation

This message follows message FABJ0221W.

System action

Processing continues. If the return code in message FABJ0221W is equal to or greater than 08, IMS HP Image Copy does not store the *report name* report for the database, partition, and DD that are shown in this message.

User response

See the description of message FABJ0221W.

Problem determination

See the description of message FABJ0221W.

FABJ0223I: THE ITKBLOAD KEYWORD WAS IGNORED BECAUSE NO SERVER NAME WAS SPECIFIED

Explanation

The IMS Tools KB load module library was specified for the ITKBLOAD keyword, but the specification was ignored because no server XCF group name is specified on the ITKBSRVR keyword.

System action

Processing continues, but IMS HP Image Copy does not store any reports to the IMS Tools KB Output repository.

User response

If you want to store the reports to the IMS Tools KB Output repository, specify the IMS Tools KB server XCF group name for the ITKBSRVR keyword.

FABJ0224I: LEVEL IS NOT HIGH ENOUGH TO SUPPORT OUTPUT REPOSITORY: *prodname*

Explanation

The maintenance level of product *prodname* does not support the IMS Tools KB Output repository.

System action

Processing continues. The reports of IMS HP Image Copy are stored to the IMS Tools KB Output repository, but the reports of product *prodname* are not stored to the IMS Tools KB Output repository.

User response

If you want to store the reports of *prodname* to the IMS Tools KB Output repository, apply the maintenance of *prodname* that supports the IMS Tools KB Output repository.

FABJ0226E: LEVEL IS NOT HIGH ENOUGH TO SUPPORT KEYWORD: *keyword*

Explanation

The maintenance level of IMS HP Pointer Checker does not support the keyword shown in the message.

System action

IMS HP Image Copy ignores the keyword that is specified for HD Pointer Checker HASH Check, and continues processing.

User response

If you want to enable the function of keyword, apply the maintenance of IMS HP Pointer Checker that supports the interface of the keyword.

FABJ0227W: RECON ENTRY WAS NOT FOUND IN ITKB

Explanation

The RECON entry is not defined in the IMS Tools KB information management environment.

System action

Processing continues, but IMS HP Image Copy does not store any reports to the IMS Tools KB Output repository.

User response

If you want to store the reports to the IMS Tools KB Output repository, add a RECON environment. For more information about adding a RECON environment, see the *IMS Tools Base Configuration Guide*.

Problem determination

Check the RECON information on the IMS Tools KB panel of the ISPF dialog. For more information about the IMS Tools KB panel, see the *IMS Tools Base IMS Tools Knowledge Base User's Guide and Reference*.

FABJ0228W: ITKB SERVER NAME WAS INCORRECT

Explanation

The connection to the IMS Tools KB server failed because the server XCF group name specified by the ITKBSRVR parameter in the PROC control statement is incorrect.

System action

Processing continues, but IMS HP Image Copy does not store any reports to the IMS Tools KB Output repository.

User response

If you want to store the reports to the IMS Tools KB Output repository, specify the correct IMS Tools KB server name.

Problem determination

Check the IMS Tools KB server XCF group name on the ITKBSRVR parameter.

FABJ0229W: HPIC WAS NOT DEFINED IN ITKB

Explanation

IMS HP Image Copy is not defined in the IMS Tools KB information management environment as a product that can store reports to the IMS Tools KB Output repository.

System action

Processing continues, but IMS HP Image Copy does not store any reports to the IMS Tools KB Output repository.

User response

If you want to store the reports to the IMS Tools KB Output repository, register the IMS HP Image Copy product by using the IMS Tools KB product administration utility (HKTAPRA0).

Problem determination

Check the listing of registered products by using the LIST command of the IMS Tools KB HKTAPRA0 utility. For more information, see the *IMS Tools Base Configuration Guide*.

FABJ0230W: REPORT WAS NOT DEFINED IN ITKB

Explanation

The report is not defined in the IMS Tools KB information management environment.

System action

Processing continues, but IMS HP Image Copy does not store the report to the IMS Tools KB Output repository.

User response

If you want to store the report to the IMS Tools KB Output repository, register the report by using the IMS Tools KB product administration utility (HKTAPRA0).

Problem determination

Check the listing of registered products and reports by using the LIST command of the IMS Tools KB HKTAPRA0 utility. For more information, see the *IMS Tools Base Configuration Guide*.

FABJ0235E: CONCURRENT IMAGE COPY CANNOT BE USED FOR VSAM KSDS. DBD=*dbdname* DDN=*dbds_ddn*

Explanation

The concurrent image copy process of IMS HP Image Copy did not create output image copy data sets for the KSDS database and index. CIC_KSDS=N was specified, but Advanced Image Copy Services was not requested for the Image Copy function.

System action

The image copy process for the KSDS is bypassed, and the return code of the image copy process is set to 8.

User response

If you want to create image copies of VSAM KSDS database data sets for recovery purposes, use the FASTIC=(,DUMP) processing of Advanced Image Copy Services. The KSDS data set must be SMS-managed, and the BWO(TYPEIMS) parameter must be specified on the AMS DEFINE or the ALTER statement. If the data set is not SMS-managed or if the parameter was not specified on the statements, the concurrent image copy process fails.

FABJ0236W: *mac-name* MACRO FAILED WITH RC=*rc* REASON=*rsn*

Explanation

The indicated macro failed. *rc* and *rsn* are return code and reason code from the macro.

System action

IMS HP Image Copy continues processing.

User response

None.

FABJ0237W: THE PROCESSING MESSAGES ARE NOT STORED TO THE ITKB OUTPUT REPOSITORY.

Explanation

IMS HP Image Copy did not store the Processing Messages report in the DFSPRINT data set to the IMS Tools KB Output repository. One of the following messages, which identifies the cause of the error, is also issued:

- FABJ0156E
- FABJ0302E
- FABJ3916E
- FABJ3972E

System action

IMS HP Image Copy continues processing, but the messages written to the DFSPRINT data set are not stored to the IMS Tools KB Output repository.

User response

Locate the associated error message.

FABJ0238E: TOIXCFGR KEYWORD NOT SUPPLIED.

Explanation

TOIAUTO=Y, TOIAUTO=S, or TOIAUTO_Q=Y is requested, but the TOIXCFGR keyword is not present on the GLOBAL statement.

System action

IMS HP Image Copy stops processing with a return code of 8. No image copies are created.

User response

Supply the TOIXCFGR keyword on the GLOBAL statement and rerun the job.

FABJ0239E: TABLEGEN STATEMENT MUST BE SPECIFIED FIRST

Explanation

The TABLEGEN statement, if specified, must be specified as the first statement in the ICEIN data set for the IMS HP Image Copy Site Default Generation utility (FABJTGEN).

System action

Program FABJTGEN stops processing with a return code of 16.

User response

Review the ICEIN data set and correct the position of the TABLEGEN statement.

FABJ0240E: MORE THAN ONE *statement* STATEMENT SPECIFIED

Explanation

More than one *statement* statement found in the ICEIN control statement for the Site Default Generation utility. Only one *statement* statement can exist in an ICEIN control statement.

System action

Program FABJTGEN stops processing with a return code of 16.

User response

Correct the error and rerun the job.

FABJ0250I: [ICOUT=%NO | STACK=%NO] IS APPLIED, IMAGE COPY DATA SET IS NOT CREATED FOR THIS DATABASE.

Explanation

The output image copy data set was not created for this database.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0251I: HPIC PROCESSING RECORD COUNT = *nnnnnnnn* FOR [DDNAME *ddname*|AREA *areaname*]

Explanation

This message shows the number of records that were processed in the indicated DD or area.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0252E: ICOUT=%NO IS APPLIED TO ALL DBDS(S) WITHOUT USING ANY FUNCTIONS

Explanation

ICOUT=%NO or STACK=%NO was specified for all databases or areas, but the HASH Check option was not requested. A valid IMS HP Image Copy function is not available to run.

System action

IMS HP Image Copy ends with a return code of 16.

User response

Check and correct the control statements on ICEIN DD.

FABJ0253E: WILDCARD SYMBOL * OR % IS SPECIFIED AS THE FIRST CHARACTER OF DBD KEYWORD

Explanation

A wildcard character, either an asterisk (*) or an percent sign (%), is used as the first character of the DBD name on the DBD keyword. A wildcard character cannot be used as the first character of the DBD keyword parameter.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Correct the value of the DBD keyword and rerun the job.

FABJ0254E: DBRC=Y IS REQUIRED WHEN USING WILDCARD SPECIFICATION IN DBD/PART KEYWORD

Explanation

When a wildcard character is used for the DBD keyword or the PART keyword, the DBRC keyword must specify Y (DBRC=Y).

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Either remove the wildcard characters from the DBD keyword or the PART keyword, or specify DBRC=Y. Rerun the job.

FABJ0270E: SENSOR=YES CANNOT BE SPECIFIED BECAUSE *reason*

Explanation

SENSOR=Y was specified on the GLOBAL statement of ICEIN DD, but the specification was not accepted because of one of the following reasons:

Table 139: Reason texts

reason	Meaning
ITKB SERVER NAME IS NOT SPECIFIED	ITKBSRVR=*servername* is not specified on the GLOBAL statement. You must specify ITKBSRVR=*servername* when you specify SENSOR=Y.

reason	Meaning
THE ITKBLOAD KEYWORD IS SPECIFIED	ITKBLOAD=*dsn* is specified; the ITKB load module library must reside in the STEPLIB DD.
IMS VERSION 9 IS NOT SUPPORTED BY DB SENSOR	DB Sensor does not support IMS 9.
NOT ALL OF THE DATABASE DATA SET GROUPS ARE SPECIFIED	A part of DBDS group was defined as the input database data set. When you run DB Sensor, all database data sets of the database must be specified as input database data sets.

System action

Processing stops.

User response

Correct the error and rerun the job.

FABJ0271W: DB SENSOR API MODULE COULD NOT BE LOADED

Explanation

The SENSOR=Y keyword is specified for full-function databases, but the specification was ignored.

System action

Program FABJMAIN continues processing the full-function databases as if SENSOR=N is specified.

User response

Ensure that a supported level of DB Sensor is available.

FABJ0272W: DB SENSOR PROCESS FOR FULL FUNCTION DATABASE WAS CANCELED BECAUSE LEVEL IS NOT HIGH ENOUGH TO SUPPORT SENSOR=YES

Explanation

The SENSOR=Y keyword is specified for full-function databases, but the specification was ignored.

System action

Program FABJMAIN continues processing the full-function databases as if SENSOR=N is specified.

User response

Ensure that the release level and maintenance level of IMS HP Pointer Checker are correct.

FABJ0273W: DB SENSOR PROCESS FOR DEDB WAS CANCELED BECAUSE LEVEL IS NOT HIGH ENOUGH TO SUPPORT SENSOR=YES

Explanation

The SENSOR=Y keyword is specified for a Fast Path database, but the specification was ignored.

System action

Program FABJMAIN continues processing the Fast Path database as if SENSOR=N is specified.

User response

Ensure that the release level and maintenance level of IMS HP Fast Path Utilities are correct.

FABJ0280I: FALLBACK PROCESS IS ACTIVE.

Explanation

The FALLBACK option is in effect. IMS HP Image Copy switches the batch image copy process to the concurrent image copy process if exclusive authorization of the input database is not granted during the batch image copy process. If IMS HP Image Copy switches the process, it issues message FABJ0281I.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0281I: BATCH IMAGE COPY PROCESS AUTOMATICALLY SWITCH TO CONCURRENT IMAGE COPY PROCESS

DBD/AREA=[*dbdname* | *partname* | *areaname*]

Explanation

IMS HP Image Copy switched the process for the indicated resource from the batch image copy process to the concurrent image copy process.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0282E: BOTH BATCH IMAGE COPY PROCESS AND CONCURRENT IMAGE COPY PROCESS FAILED FOR DBD=[*dbdname* | *partname*]

DDN/AREA=[*ddname* | *areaname*]

Explanation

The FALLBACK option is in effect. However, both the batch image copy process and the concurrent image copy process failed for the indicated resource.

System action

IMS HP Image Copy continues processing the next database, partition, or area. The job-step return code is set to 8.

User response

Locate the corresponding messages, which are FABJ0183I, FABJ4232E, FABJ4243E, and FABJ0235E, and identify the cause of the error.

FABJ0283E: SWITCHING TO CONCURRENT IMAGE COPY PROCESS FAILED

DBD/AREA=[*dbdname* | *partname* | *areaname*]

Explanation

The FALLBACK option is in effect and the process was switched to the concurrent image copy process. However, after switching to the concurrent image copy process, read-only authorization for the resource was still not granted. The image copy data set of the database is not created.

System action

IMS HP Image Copy continues processing the next database. The job-step return code is set to 8.

User response

Locate IMS message DFS047A or DFS3710A, and identify the cause of the error.

FABJ0284E: HP IMAGE COPY PROCESS FAILED TO OBTAIN THE DATABASE AUTHORIZATION DBD/AREA=[*dbdname* | *partname* | *areaname*]

Explanation

IMS HP Image Copy was unable to obtain required database authorization (read-exclusive, read-only, or both). Image copy data set for the indicated resource is not created.

System action

IMS HP Image Copy continues processing the next database. The job-step return code is set to 8.

User response

Locate IMS message DFS047A or DFS3710A, and identify the cause of the error.

FABJ0290E: THE NUMBER OF REQUESTED DBDS OF FULL FUNCTION DATABASE EXCEEDS 2000

Explanation

The number of requested full-function database data sets in a job step exceeds 2000. The maximum allowed number of database data sets in a job step is 2000.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Locate message FABJ0293E to identify the number of requested database data sets and areas. Then, divide the job step into multiple job steps and ensure that the requested number of database data sets and areas in each job step is fewer than the maximum number allowed. Rerun the job.

FABJ0291E: THE NUMBER OF REQUESTED AREA EXCEEDS 2048

Explanation

The number of requested DEDB areas in a job step exceeds 2048. The maximum allowed number of areas in a job step is 2048.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Locate message FABJ0293E to identify the number of requested areas. Then, divide the job step into multiple job steps and ensure that the requested number of database data sets and areas in each job step is fewer than the maximum number allowed. Rerun the job.

FABJ0292E: THE NUMBER OF REQUESTED DBDS AND AREA EXCEEDS 2048

Explanation

The total number of requested database data sets and areas in a job step exceeds 2048. The maximum allowed total number of database data sets and areas in a job step is 2048.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Locate message FABJ0293E to identify the number of requested database data sets and areas. Then, divide the job step into multiple job steps and ensure that the requested number of database data sets and areas in each job step is fewer than the maximum number allowed. Rerun the job.

FABJ0293E: THE NUMBER OF REQUESTED DBDS AND AREA: DBDS=*nnnnnn* AREA=*mmmmmm*

Explanation

This message shows the number of requested database data sets and areas in a job step. This message is associated with FABJ0290E, FABJ0291E, or FABJ0292E message. See the explanation and the user response of the associated message.

System action

See the system action of the associated message.

User response

See the user response of the associated message.

FABJ0294E: NO MATCHING DBD FOR DBD=*dbdname* IS FOUND IN RECON

Explanation

The DB record that corresponds to DBD=*dbdname* is not found in the DBRC RECON data sets.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Ensure that the DB record exists in the RECON data sets and rerun the job.

FABJ0295E: NO MATCHING DBD [OR PARTITION] FOR DBD=*dbdname* [PART=*partname*] IS FOUND

Explanation

The DB record that corresponds to DBD=*dbdname* (PART=*partname*) is not found in the DBRC RECON data sets.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Ensure that the DB record (including the partition information) exists in the RECON data sets and rerun the job.

FABJ0296E: NO PROCESSED DB IS FOUND

Explanation

No image copies are created because none of the DBDs identified from DBRC RECON data sets exist in the DBD library.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Ensure that the RECON data sets are correct and the IMS DD statement is specified correctly. Rerun the job.

FABJ0300I: HPIC [IMAGE COPY | RECOVERY] FUNCTION USING THE IMS-COMPATIBLE JCL

Explanation

The IMS HP Image Copy function is invoked by IMS compatible JCL stream that is set up to run the IMS Image Copy utility (DFSUDMP0) or the IMS Database Recovery utility (DFSURDB0).

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0301E: FORMAT OF IMAGE COPY DATA SET IS NOT SUPPORTED FOR HPIC RECOVERY FUNCTION USING THE IMS-COMPATIBLE JCL

Explanation

The format of the input image copy data for the Recovery function invoked by IMS compatible JCL is identified as in standard or compressed Image Copy format, but the data set is registered as Fast Recovery image copy format.

System action

The recovery process fails.

User response

Rerun the Recovery function by using FABJMAIN JCL, or correct the image copy type flag in DBRC to the appropriate type.

FABJ0302E: OPEN FABJDFSP FAILED.

Explanation

An attempt to open the internal data set that is associated with the FABJDFSP DD failed.

System action

IMS HP Image Copy continues processing, but the messages written to the DFSPRINT data set are not stored to the IMS Tools KB Output repository.

User response

Contact IBM® Software Support.

FABJ0303E: THE TYPE OF THE SITE DEFAULT TABLE IS INCORRECT.

Explanation

The site default table was loaded, but the type of the site default table is incorrect. Either the site default table for IMS compatible JCL was loaded in FABJMAIN job or the site default table for FABJMAIN was loaded in IMS compatible JCL job.

System action

IMS HP Image Copy stops processing with a return code of 16.

User response

Re-create the site default table. While re-creating the site default table, ensure that the module name and the entry name of the site default table are specified correctly:

- To create a site default table for FABJMAIN, specify FABJGLB0.
- To create a site default table for IMS compatible JCL, specify FABJGLI0.

After you re-create the site default table, rerun the job.

FABJ0304I: THE HPIO INTERFACE IS USED.

Explanation

IMS HP Image Copy is using the High Performance Input/Output (HPIO) interface to access the databases that use OSAM data sets or VSAM ESDS data sets.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0305W: THE CREATED IMAGE COPY DATA SET IS NOT CATALOGED.

Explanation

An image copy data set was created on the tape device. However, this image copy data set was not cataloged.

System action

IMS HP Image Copy continues processing. If a value is specified for the CATLGERROR keyword in the HPSRETCD DD statement, IMS HP Image Copy changes the job-step return code to that value.

User response

Ensure that the catalog definition is correct and catalog the image copy data set manually. If the problem persists, report the return code and reason code from the catalog process to your system administrator.

> **Tip:** This message indicates a warning condition but the return code is RC=00. If you want a different return code to alert you of this condition, specify CATLGERROR=*rc* in the HPSRETCD DD statement.

FABJ0306I: DSN: *data_set_name*.

Explanation

This message displays supplemental explanation of the message which appears before this.

System action

Not applicable.

User response

None. This message is informational.

FABJ0307W: THE CREATED IMAGE COPY DATA SET IS NOT CATALOGED BECAUSE THE SAME DATA SET NAME ALREADY EXISTS IN THE CATALOG AS CSIETYPE=x.

Explanation

An image copy data set was created on the tape device. However, this image copy data set was not cataloged because a data set with the same name already exists in the catalog. CSIETYPE=x identifies the type of the data set that already exists in the catalog. x shows one of the following letters:

B

The base entry of the generation data group (GDG)

C

VSAM cluster

D

Data component of VSAM data set

G

Alternate indexes

I

Index component of a VSAM key-sequenced data set

L

Automated tape library (ATL)

R

File path

U

User catalog connector entry

W

ATL volume entry

X

Alias

System action

IMS HP Image Copy continues processing. If a value is specified for the CATLGERROR keyword of the HPSRETCD DD statement, IMS HP Image Copy changes the job-step return code to that value.

User response

Complete either of the following steps:

- Ensure that the image copy data set name is correct and catalog the image copy data set manually after deleting the existing entry in the catalog.
- Rerun the job with the IMS HP Image Copy data set naming template enabled so that the new image copy data set is created with a different data set name. The default process return code for the catalog process

is RC=00 even if a catalog error is detected. If you want to change the return code, specify CATLGERROR=*rc* in the HPSRETCD DD statement and rerun the job.

FABJ0310E: WHEN INPUT DATABASE IS ENCRYPTED, HPIC CANNOT USE DFSMSDSS DUMP COMMAND PROCESS

DBD=*dbdname* DD/AREA=*dd_or_area*

Explanation

One of input database data sets that is processed in the DUMP process of Advanced Image Copy is encrypted. The DUMP process does not support encrypted data sets.

System action

FABJMAIN stops processing with a return code of 8.

User response

Modify the control statements so that the encrypted database data set is excluded from the job or use other image copy process.

FABJ0311E: WHEN INPUT DATABASE IS EXTENDED ADDRESSABILITY ATTRIBUTE, HPIC CANNOT CREATE IMAGE COPY

DBD=*dbdname* AREA=*areaname* [ADS=*ads_name*]

Explanation

DEDB area data set has been allocated with the EXTENDED ADDRESSABILITY attribute. DEDB area data sets with this attribute cannot be processed by IMS HP Image Copy.

System action

FABJMAIN stops processing with a return code of 8.

User response

Review the allocation attributes of the area data set and, if necessary, reallocate the area data set without the EXTENDED ADDRESSABILITY attribute.

FABJ0313E: VSAM ESDS DATA SET IS USED FOR OSAM OF DBD=*dbdname* DDN=*ddname*

Explanation

One or more VSAM ESDSs are allocated for the OSAM database. ESDSs are not supported for OSAM databases.

System action

IMS HP Image Copy ends the job with return code 16.

User response

Ensure that the correct database data sets are allocated. If you want to use z/OS® encryption for OSAM data sets, you must use linear data sets (LDS).

FABJ0314E: IMS LEVEL IS NOT HIGH ENOUGH TO SUPPORT VSAM LDS DATA SET OF OSAM DBD=*dbdname* DDN=*ddname*

Explanation

The maintenance level of IMS does not support z/OS® encryption for OSAM data sets.

System action

IMS HP Image Copy ends the job with return code 16.

User response

If you want to enable OSAM data set z/OS® encryption, ensure that the maintenance level of the IMS runtime library is high enough to support it.

FABJ0315E: THE INPUT DATABASE DATA SET IS MIGRATED BY SYSTEM. DBD=*dbdname* DDN/AREA=*ddname*

Explanation

The input database data set is migrated by the system. IMS HP Image Copy cannot access the data set.

System action

IMS HP Image Copy ends the job with return code 16.

User response

Before running the IMS HP Image Copy job, perform the RECALL process to manually bring back the data set back to DASD.

FABJ0316E: DBD=*dbdname* DDN/AREA=*ddname* IS NOT PROCESSED DUE TO THE EXTENDED FORMAT DATA SET

Explanation

The process for the indicated database data set failed because the database data set (*ddname*) of database *dbdname* is allocated as an extended format data set. IMS HP Image Copy does not support extended format data sets in the following processes:

- DUMP process of Advanced Image Copy Services
- Logical copy process (CRCTYPE=L) of the Create Image Copy function

System action

IMS HP Image Copy ends the job with return code 8.

User response

Apply the following options and rerun the job:

- To create an image copy with the Image Copy function, FASTIC=(,COPY), which enables the COPY process of the Advanced Image Copy Services, or FASTIC=NO, which disables Advanced Image Copy Services.
- To create a copy of an image copy with the Create Image Copy function, CRCTYPE=P, which creates a physical copy (instead of CRCTYPE=L, which creates a logical copy).

FABJ0400I: IMS MANAGED ACBS IS USED

Explanation

The process uses IMS-managed ACBs instead of ACBs in the DBD library.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0402I: A NON-RECOVERABLE DBDS IS DETECTED: DB/PART NAME=*dbdname* DD/AREA=*ddname*

Explanation

A recovery requested database data set is flagged as NON-RECOVERABLE.

System action

Program FABJMAIN stops processing with a return code of 4.

User response

None. This message is informational.

FABJ0403W: DBDS MEMBER DD=*ddname* IN GROUP NAME=*name* IS NOT A HALDB PART DATA, DL/I DBDS, OR DEDB DBDS

Explanation

The indicated member (DD=*ddname* in GROUP NAME=*name*) is not a database supported by IMS HP Image Copy.

System action

Program FABJMAIN ignores the member and continues processing.

User response

Verify the DD=*ddname* in the GROUP of DBRC.

FABJ0404E: CANNOT RECALL DATA SET DUE TO AN ERROR IN ARCHRCAL. RC=*rc*, RSN=*rsn*, DBD=*dbdname*, DDN/AREA=*ddname*, DATA SET=*dsname*

Explanation

Failed to recall migrated data set *dsname*. The ARCHRCAL macro of DFSMShsm returned an error indication, which is shown with RC=*rc* and RSN=*rsn*.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Locate associated DFSMShsm messages (ARC*nnnni*) in the job log and resolve the problem. If the problem persists, contact IBM® Software Support.

FABJ0405E: RECALL IS NOT PERFORMED DUE TO AN ERROR IN ARCHSEND. RC=*rc*, RSN=*rsn*

Explanation

The Image Copy function issued the DFSMShsm ARCHSEND macro to check the hsm task in the system but the macro returned an error indication, which is shown with RC=*rc* and RSN=*rsn*.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Locate associated DFSMShsm messages (ARC*nnnni*) in the job log and resolve the problem. If the problem persists, contact IBM® Software Support.

FABJ0406E: DFSMSHSM IS NOT RUNNING IN THE SYSTEM. ARCHSEND RC=100, RSN=*rsn*

Explanation

DFSMShsm is not active. RC and RSN show return code and reason code from the ARCHSEND macro.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Start DFSMShsm in your system.

FABJ0423I: KEYWORD USER= IS IGNORED BECAUSE OF UNSUPPORTED LEVEL OF HPPC

Explanation

The USER keyword is ignored.

System action

Program FABJMAIN continues processing.

User response

Check the release level and maintenance level of IMS HP Pointer Checker.

FABJ0424I: NO ZIIP PROCESSOR AVAILABLE FOR USE

Explanation

ZIIPMODE=COND is specified. However, no zIIP processor is available.

System action

IMS HP Image Copy continues processing without using zIIP processors.

User response

Check the version of z/OS®.

FABJ0425I: ZIIP PROCESSOR AVAILABLE FOR USE

Explanation

ZIIPMODE=COND is specified. IMS HP Image Copy found a zIIP processor that can be used for the job.

System action

IMS HP Image Copy continues processing with zIIP processors.

User response

None. This message is informational.

FABJ0426I: ZIIP TIME (HH:MM:SS:TH) WAS: *hh:mm:ss:th*

Explanation

This informational message shows the CPU time consumed by zIIP processors for the IMS HP Image Copy job.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ0427I: ZIIP API MACRO FAILED FUNC=INIT RC=*rc* REASON=*rsn*. HPIC CONTINUES THE PROCESSING WITHOUT ZIIP.

Explanation

INIT call of ZIIP API has failed, but IMS HP Image Copy continues processing.

System action

IMS HP Image Copy continues processing without zIIP.

User response

If the return code is 04 and the reason code is 04, ensure that your environment is correctly set up:

- You are using one of the currently supported versions of z/OS® and the PTF for using zIIP has been applied.
- The zIIP processor is correctly set up.

If the problem persists, contact IBM® Software Support.

FABJ0428E: ZIIP API MACRO FAILED FUNC=*func* RC=*rc* REASON=*rsn*

Explanation

The indicated function call of ZIIP API has failed.

System action

IMS HP Image Copy stops processing with return code 16.

User response

Contact IBM® Software Support.

FABJ0429I: MODULE *module* NOT FOUND. HPIC CONTINUES THE PROCESSING.

Explanation

Module named *module* is not found.

System action

IMS HP Image Copy continues processing.

User response

Make sure that all required libraries are concatenated to the IMS HP Image Copy job step.

FABJ0444I: *text*

Explanation

This message shows program progression.

System action

Program FABJMAIN continues processing.

User response

None. This message is informational.

FABJ0450E: *function_name* LEVEL IS NOT HIGH ENOUGH TO SUPPORT VSAM LINEAR DATA SET OF OSAM

Explanation

The indicated product function cannot start its process. Either the release level or the maintenance level of the product is low and it does not support VSAM linear data sets of OSAM databases.

System action

If the product function is HDPC (HD Pointer Checker of IMS HP Pointer Checker), IMS HP Image Copy ends the job with return code 8. If the product function is DB SENSOR, IMS HP Image Copy ends the job with return code 16.

User response

Ensure that the required maintenance to support VSAM linear data sets is applied to the product.

FABJ0451E: HPPC LEVEL IS NOT ENOUGH TO USE DB SENSOR FOR VSAM LINEAR DATA SET OF OSAM

Explanation

The DB Sensor process that is called during HASH Check cannot be started. The maintenance level of DB Sensor is not sufficient to support VSAM linear data sets of OSAM databases.

System action

IMS HP Image Copy ends the job with return code 16.

User response

Ensure that the required maintenance to support VSAM linear data sets is applied to the owner product of DB Sensor.

FABJ0452E: LEVEL OF DB SENSOR FOR FULL FUNCTION DATABASE IS NOT HIGH ENOUGH TO SUPPORT IMS MANAGED ACBS ENVIRONMENT

Explanation

DB Sensor for the full-function database cannot be started. The maintenance level of DB Sensor for full-function database is not high enough to run in an IMS-managed ACBs environment.

System action

IMS HP Image Copy ends the job with return code 16.

User response

Ensure that the required maintenance to support IMS-managed ACBs environment is applied to the owner product of DB Sensor.

FABJ0601E: MODULE *module* NOT FOUND

Explanation

The indicated module, which is a required module, is not found in the load library.

System action

The Image Copy function ends with a return code of 8.

User response

Ensure that the IMS HP Image Copy execution library is correctly concatenated to the STEPLIB or the JOBLIB DD statement. Rerun the job.

FABJ0999E: FABJ*aaaa* FUNC=*bbbb* RETURN CODE=*nnnnnnn* REASON CODE=*mmmmmmmm*

Explanation

An error is detected during the image copy process under IMS Database Reorganization Expert. FUNC=*bbbb* of program FABJ*aaaa* of IMS HP Image Copy detected an error. Check the return code *nnnnnnn* and reason code *mmmmmmmm* in "Return codes and reason codes under IMS Database Reorganization Expert" on page 395.

System action

Program FABJ*aaaa* issues an error message.

User response

Correct the error and rerun the job.

FABJ3701E: INVALID REQUEST CODE(*nnnn*)

Explanation

An internal error has occurred.

System action

Program FABJMAIN issues a user error abend code of 3701.

User response

Contact IBM® Software Support.

FABJ3702E: INVALID DD NAME LENGTH(*nnnn*)

Explanation

An internal error has occurred.

System action

Program FABJMAIN issues a user error abend code of 3702.

User response

Contact IBM® Software Support.

FABJ3703E: MESSAGE TEXT NOT FOUND(*cccc*)

Explanation

Message text is not found internally.

System action

Program FABJMAIN issues a user error abend code of 3703.

User response

Contact IBM® Software Support.

FABJ3710E: TOSI API *function* FAILED WITH RC=*rrrrrrrr* AND RSN=*ssssssss*. HPIC ABEND REASON CODE IS *reason_code*.

Explanation

An error occurred in the indicated TOSI API function. The HPIC ABEND REASON CODE (*reason_code*) provides additional information:

- If the code is 01, the TOSI API error occurred before issuing the /DBR, /DBD, UPDATE START(QUIESCE) command. The resources are not stopped or quiesced.
- If the code is 02, the TOSI API error occurred after issuing the /DBR, /DBD, UPDATE START(QUIESCE) command. Some resources must be activated manually.

System action

IMS HP Image Copy ends abnormally. If the HPIC ABEND REASON CODE is 01, no image copies are created.

User response

If the HPIC ABEND REASON CODE is 02, locate FABJ4623E messages. FABJ4623E messages contain the resource names for which you must issue IMS commands. If no FABJ4623E messages are issued, then you do not need to issue IMS commands manually.

For each resource identified by FABJ4623E messages, issue the following command:

- If TOIAUTO=Y, restart the resource by manually issuing the /START command.
- If TOIAUTO_Q=Y, release the quiesce of the resource by manually issuing the UPDATE STOP(QUIESCE) command.

To resolve the problem, locate the IMS Tools Online System Interface error message that corresponds to the indicated TOSI API function:

Table 140: TOSI API functions and error messages

TOSI API *function*	**IMS Tools Online System Interface error message**
INIT	FOI511E
CONNECT	FOI524E
DISCONNECT	FOI571E
TERM	FOI581W

Follow the User Response of the error message in the *IMS Tools Base IMS Tools Common Services User's Guide and Reference* and correct the error. If the problem persists, contact IBM® Software Support.

FABJ3801E: DBRC DBDS RECORD NOT FOUND FOR DB/PART NAME=*dbdname* DD/AREA NAME=*ddname*

Explanation

The error might be due to one of the following reasons:

- The required RECON DBDS record associated with the indicated data set group of the DL/I database or the area of the DEDB was not found.
- The Recovery function is requested, but the associated DBDS record was not found.
- A CAGRP or DBDSGRP record was found without the associating DBDS record.

System action

FABJMAIN issues a user error abend code of 3801.

User response

Make sure that the required RECON DBDS record exists in the RECON data set. Correct the error and rerun the job.

FABJ3802E: DBRC GROUP RECORD NOT FOUND FOR GROUP NAME=*group*

Explanation

The required RECON CAGRP record or DBDSGRP record associated to the indicated group *group* was not found.

System action

Program FABJMAIN issues a user error abend code of 3802.

User response

Make sure that the required RECON CAGRP or DBDSGRP record exists in the RECON data set. Correct the error and rerun the job.

FABJ3803E: DBRC DBDS RECORD NOT SAME DB TYPE AS SPECIFIED FOR DB/PART NAME=*dbdname* DD/AREA NAME=*ddname*

Explanation

The RECON DBDS record is not the same database type as the one specified in the ICEIN control statement.

System action

Program FABJMAIN issues a user error abend code of 3803.

User response

Correct the error and rerun the job.

FABJ3804E: ANY DBRC DBDS RECORD NOT FOUND FOR DB NAME=*database*

Explanation

No DBDS record was found for the database *database*.

System action

Program FABJMAIN issues a user error abend code of 3804.

User response

Correct the error and rerun the job.

FABJ3805E: NO ADS REGISTERED WITH DBRC FOR DB NAME=*database* AREA NAME=*area*

Explanation

No ADS is registered in the DBRC for database *database* and area *area*.

System action

Program FABJMAIN issues a user error abend code of 3805.

User response

Correct the error and rerun the job.

FABJ3806E: DBDS OR AREA NOT RECOVERY NEEDED FOR DB/PART NAME=*dbdname* DD/AREA NAME=*ddname*

Explanation

The Recovery function was requested for the indicated database data set, but the recovery needed status for the DEDB data set is not set in the DBRC RECON data set.

System action

Program FABJMAIN issues a user error abend code of 3806.

User response

The recovery needed status is required to run the Recovery function. Set the status with the CHANGE.DBDS DBRC command, and rerun the job.

FABJ3807E: GROUP TYPE IS NOT DBDS BUT DB FOR GROUP NAME=*group*

Explanation

The RECON CAGRP or DBDSGRP record is defined with the DBD member type. Program FABJMAIN supports only the CAGRP or the DBDSGRP defined with the DBDS member type.

System action

FABJMAIN issues a user error abend code of 3807.

User response

Correct the error and rerun the job.

FABJ3808E: NO AVAILABLE ADS FOUND FOR DB NAME=*database* AREA NAME=*area*

Explanation

No ADS was available for database *database* and area *area*. The requested Image Copy function cannot continue the processing until at least one area data set is available.

System action

Program FABJMAIN issues a user error abend code of 3808.

User response

Correct the error and rerun the job.

FABJ3809E: SPECIFIED ADS NOT REGISTERED WITH DBRC FOR AREA NAME=*area* ADS DD NAME=*ddname*

Explanation

The specified area data set with the ddname *ddname* is not registered in the RECON DBDS record for the area *area*.

System action

Program FABJMAIN issues a user error abend code of 3809.

User response

Correct the error and rerun the job.

FABJ3810E: DATA SET OPEN ERROR FOR DD NAME=*ddname*

Explanation

An attempt to OPEN the data set associated with the DD name *ddname* failed.

System action

Program FABJMAIN issues a user error abend code of 3810.

User response

Make sure that the DD statement of the indicated ddname is the proper data set.

FABJ3811E: DEVTYPE ERROR FOR DD NAME=*ddname*

Explanation

Issuing a DEVTYPE macro for the data set associated to the DD name *ddname* failed.

System action

Program FABJMAIN issues a user error abend code of 3811.

User response

Correct any obvious errors, and rerun the job. If the problem persists, contact IBM® Software Support.

FABJ3812E: GETMAIN ERROR FOR CONTROL BLOCK=*cccccccccc*

Explanation

An attempt for the GETMAIN macro or the FREEMAIN macro has failed. The message varies by operation.

System action

Program FABJMAIN issues a user error abend code of 3812.

User response

Increase the region size parameter on the JOB statement, and rerun the job. If the problem persists, contact IBM® Software Support.

FABJ3813E: MODCB ERROR REG15=*aa* REG0=*bb*

Explanation

An attempt by MODCB failed. The contents of the general-purpose register 15 and 0 are shown.

System action

Program FABJMAIN issues a user error abend code of 3813.

User response

Correct the error and rerun the job.

FABJ3814E: SHOWCB ERROR REG15=*aa* REG0=*bb*

Explanation

An attempt by SHOWCB failed. The contents of the general-purpose register 15 and 0 are shown.

System action

Program FABJMAIN issues a user error abend code of 3814.

User response

Correct the error and rerun the job.

FABJ3815E: RECON DATA SET GET ERROR RC=*rrrrrr* REASON=*xxxxxxx*

Explanation

An attempt to GET a RECON record failed. The error return code and reason code are shown.

System action

Program FABJMAIN issues a user error abend code of 3815.

User response

Correct the error and rerun the job.

FABJ3816E: RECON DATA SET OPEN ERROR RC=*rrrrrr* REASON=*xxxxxxx*

Explanation

An attempt to OPEN a RECON data set failed. The error return code and reason code are shown.

System action

Program FABJMAIN issues a user error abend code of 3816.

User response

Correct the error and rerun the job.

FABJ3817E: NO IMAGE COPY REGISTERED WITH DBRC TO RECOVER DB/PART NAME=*bbbbbbbb* DD/AREA NAME=*aaaaaaaa*

Explanation

No recoverable image copy data set is registered with the DBRC for the database or partition *dddddddd* and DDN or AREA=*aaaaaaaa*.

System action

Program FABJMAIN issues a user error abend code of 3817.

User response

Correct the error and rerun the job.

FABJ3818E: NO VALID IMAGE COPY TO TIMESTAMP RECOVER DB/PART NAME=*dddddddd* DD/AREA NAME=*aaaaaaaa*

Explanation

No valid image copy data set that has corresponding specified time stamp is found in the DBRC for the database or partition *dddddddd* and DDN or AREA=*aaaaaaaa*.

System action

Program FABJMAIN issues a user error abend code of 3818.

User response

Check the required time stamp of TIMESTMP. Correct the error and rerun the job.

FABJ3819E: BLDL ERROR REG15=*aa* REG0=*bb*

Explanation

An attempt by BLDL failed. The contents of the general-purpose register 15 and 0 are shown.

System action

Program FABJMAIN issues a user error abend code of 3819.

User response

Correct the error and rerun the job.

FABJ3821E: DBRC GENJCL.RECOV ERROR FOR DB/PART NAME=*dbdname* DD/AREA NAME=*ddname*

Explanation

An internal GENJCL.RECOV process for the database *dbdname* DDN= or AREA=*ddname* failed.

System action

Program FABJMAIN issues a user error abend code of 3820.

User response

Specify the SYSPRINT DD statement so that you can review the error messages for the GENJCL.RECOV command. Correct the error and rerun the job.

FABJ3822E: TIMESTAMP VALUE GREATER THAN CURRENT TIME FOR DB/PART NAME=*dddddddd* DD/AREA=*bbbbbbbb*

Explanation

The specified time stamp for DB/PART is a future time.

System action

Program FABJMAIN issues a user error abend code of 3822.

User response

Correct the time stamp, and rerun the job.

FABJ3823E: TIMESTAMP REQUEST INCONSISTENT WITH RECON ALLOC RECORD FOR DB/PART NAME=*dbdname* DD/AREA NAME=*ddname*

Explanation

The specified time stamp for the Recovery function is not correct, and the correct IC data set is not found in the DBRC.

System action

Program FABJMAIN issues a user error abend code of 3823.

User response

Make sure that the time stamp specified for the TIMESTMP keyword is correct. If it is not, specify the correct time stamp and rerun the job.

FABJ3824E: RDJFCB FAILED FOR RECON DATA SET OF DD NAME=*ddname*

Explanation

The RDJFCB macro for DD name *ddname* failed.

System action

Program FABJMAIN issues a user error abend code of 3824.

User response

Check the data set with the DD name *ddname*, and rerun the job.

FABJ3825E: OBTAIN ERROR FOR VOLUME=*volume* RC=*nn*

Explanation

An attempt to OBTAIN a RECON VOLUME failed.

System action

Program FABJMAIN issues a user error abend code of 3825.

User response

Correct the error and rerun the job.

FABJ3830E: INVALID IMS RELEASE LEVEL RECON DATA SET IS USED FOR DD NAME=*ddname*

Explanation

The data set used for the DD name *ddname* was not a correct IMS release level of the RECON data set.

System action

Program FABJMAIN issues a user error abend code of 3830.

User response

Specify the correct IMS release level of the RECON data set, and rerun the job.

FABJ3831E: NO RECON HEADER RECORD FOUND OR INVALID IMS RELEASE LEVEL RECON DATA SET IS USED FOR DD NAME=*ddname*

Explanation

The data set used for the DD name *ddname* is not a RECON data set or a correct IMS release level of the RECON data set.

System action

Program FABJMAIN issues a user error abend code of 3831.

User response

Specify the correct IMS release level of the RECON data set, and rerun the job.

FABJ3832E: NO RECON HEADER EXTENSION RECORD FOUND FOR DD NAME=*ddname*

Explanation

The data set used for the DD name *ddname* is not a RECON data set or a correct IMS release level of the RECON data set.

System action

Program FABJMAIN issues a user error abend code of 3832.

User response

Specify the correct IMS release level of the RECON data set, and rerun the job.

FABJ3833E: TWO VALID RECON DATA SETS NOT PROVIDED

Explanation

Two correct IMS release levels of RECON data sets were not provided.

System action

Program FABJMAIN issues a user error abend code of 3833.

User response

Specify the two correct IMS release levels of the RECON data sets, and rerun the job.

FABJ3834E: NOCOEX MODE RECON DATA SET IS USED FOR DD NAME=*ddname*

Explanation

The version of IMS on which IMS HP Image Copy is running is lower than the minimum supported version for the RECON data set.

System action

Program FABJMAIN issues a user error abend code of 3834.

User response

Correct the specification of the RECON data set and rerun the job.

FABJ3835E: DBRC COMMAND *command* PROCESS FAILED RC=*nn* (DBD=*name* [DDN | AREA]=*name*)

Explanation

The *command* DBRC command was issued but DSPURX00 returned a nonzero return code.

System action

Program FABJMAIN stops processing with an abend code of 3*xxx*.

User response

If you have specified the ICEDLIST DD statement, you can check the error messages from DSPURX00. Correct the error and rerun the job.

FABJ3900E: HP IMAGE COPY DETECTS ERRORS DURING [IMAGE COPY DATA SET CREATING PROCESS | DATABASE RECOVERY PROCESS].

Explanation

IMS HP Image Copy ends due to errors.

System action

Program FABJMAIN ends with an abend code of 3900.

User response

Locate other error messages and correct the errors. Rerun the IMS HP Image Copy job.

FABJ3903E: OPEN *ddname* FAILED

Explanation

An attempt to open the data set associated with the DD name *ddname* failed.

System action

Program FABJMAIN issues a user error abend code of 3903.

User response

Make sure that the DD statement specifies the correct ddname of the data set.

FABJ3904E: CLOSE *ddname* FAILED

Explanation

An attempt to close the data set associated with the DD name *ddname* failed.

System action

Program FABJMAIN issues a user error abend code of 3904.

User response

Contact IBM® Software Support.

FABJ3905E: *ddname* DD NOT FOUND

Explanation

The required DD statement *ddname* is not found in the JCL.

System action

Program FABJMAIN issues a user error abend code of 3905.

User response

Provide the indicated DD statement correctly, and rerun the job.

FABJ3906E: MODULE *module* NOT FOUND

Explanation

The required module *module* is not found in the loadable library.

System action

Program FABJMAIN issues a user error abend code of 3906.

User response

Make sure that the IMS HP Image Copy execution library is correctly concatenated to the STEPLIB or the JOBLIB DD statement. Rerun the job.

FABJ3907E: *ddname* DD FOR DEDB AREA NOT FOUND

Explanation

The required DD statement *ddname* for DEDB AREA is not found in the JCL. The ddname with the same name as the area name is required because the area data set is not registered in the RECON data set, or IMS HP Image Copy is running with DBRC=N.

System action

Program FABJMAIN issues a user error abend code of 3907.

User response

Take one of the following actions and rerun the job:

- Provide the correct DD statement with the indicated area name.
- Make sure that the DD statement with the correct ADDN is specified for the area data set that is registered in the RECON data set, and specify DBRC=Y.

FABJ3908E: DBD *dbdname* NOT FOUND IN DBDLIB

Explanation

The indicated DBD member is not found in the DBD library that is specified by the IMS DD statement in the JCL.

System action

Program FABJMAIN issues a user error abend code of 3908.

User response

Make sure that the correct DBD library is specified for the IMS DD statement. Rerun the job.

FABJ3909E: AREA SPECIFIED AGAINST DLI/PARTITIONED DATABASE: *database*

Explanation

The AREA keyword is specified for DL/I database *database*, which is incorrect.

System action

Program FABJMAIN issues a user error abend code of 3909.

User response

Make sure that the correct DBD library is specified on the IMS DD statement. Correct the error and rerun the job.

FABJ3910E: DDN SPECIFIED AGAINST DEDB: *database*

Explanation

The DDN keyword is specified for DEDB *database*, which is incorrect.

System action

Program FABJMAIN issues a user error abend code of 3910.

User response

Make sure that the correct DBD library is specified on the IMS DD statement. Correct the error and rerun the job.

FABJ3911E: AREA NOT SPECIFIED AGAINST DEDB: *database*

Explanation

The AREA keyword is required for DEDB processing.

System action

Program FABJMAIN issues a user error abend code of 3911.

User response

Add the AREA keyword to the control statement, and rerun the job.

FABJ3912E: DUPLICATE DDNAME SPECIFIED ON *statement* STATEMENT: *ddname*

Explanation

DD name *ddname* is specified for the *statement* statement with multiple ICOUT keywords. The DD name specified on each ICOUT keyword must be unique.

System action

Program FABJMAIN issues a user error abend code of 3912.

User response

Correct the error and rerun the job.

FABJ3913E: PRIMARY STACK DATA SET IS DUMMY: *ddname*

Explanation

The indicated DD statement (*ddname* DD) is specified with DUMMY. The stack output suppression with the DUMMY DD statement is allowed only for the secondary stack.

System action

Program FABJMAIN issues a user error abend code of 3913.

User response

Correct the error and rerun the job.

FABJ3914E: STACK DATA SET IS NOT ON TAPE: *ddname*

Explanation

The stacked data set associated with the indicated ddname (*ddname*) is allocated to a non-tape unit. The stacked data set must be allocated on a tape unit.

System action

Program FABJMAIN issues a user error abend code of 3914.

User response

Specify the UNIT parameter with the unit name for tape devices or specify the DD statement for the stacked data set with the unit name for tape devices, and rerun the job.

FABJ3915E: UNABLE TO ASSIGN UNIQUE DDNAME FOR IC DATA SET

Explanation

An attempt to assign a unique ddname for the image copy data set, requested by the ICOUT=*, failed. The cause of this error might be due to the number of image copy data sets exceeding the maximum value of 4095.

System action

IMS HP Image Copy issues a user error abend code of 3915.

User response

Separate the job steps into two so that the number of the image copy data sets is less than the maximum. Rerun the job. If the problem persists, contact IBM® Software Support.

FABJ3916E: DYNAMIC ALLOCATION FAILURE OCCURRED FOR DD: *ddname* RC=*rrrr* RSN=*eeeeiiii zzzz*

Explanation

An attempt to dynamically allocate the indicated DD (*ddname*) failed. *rrrr* indicates the return code from SVC99. *eeee* indicates the S99 ERROR contents. *iiii* indicates S99 INFO contents. *zzzz* indicates S99 ERSN contents.

Explanation of common S99 errors:

X'0204'

Virtual storage unavailable.

X'020C'

Request for exclusive use of a shared data set cannot be honored.

X'0210'

Requested data set unavailable. The data set is allocated to another job and its usage attribute conflicts with this request.

X'0214'

Devices not available; or, if allocating an internal reader, all defined internal readers are already allocated.

X'0218'

Specified volume or an acceptable volume is not mounted, and user does not have volume mounting authorization through the DYNALLOC request.

X'021C'

Device name specified is undefined.

X'0438'

Specified ddname not found.

X'1708'

GDG data set is not found.

X'970C'

Severe SMS VTOC service error. Check the S99 ERSN.

System action

Program FABJMAIN issues a user error abend code of 3916.

User response

Correct the error and rerun the job. The return codes and the reason codes are described in the *MVS™ Programming: Authorized Assembler Services Guide*.

FABJ3917E: DSN: *data_set_name* DISP: *cccc*

Explanation

This message displays supplemental explanation of the message that appears before this message.

System action

Not applicable.

User response

None.

FABJ3918E: DFSMDA MEMBER NOT FOUND FOR DB: *dddddddd*

Explanation

DFSMDA MEMBER was not found for the database or RECON data set *dddddddd*.

System action

Program FABJMAIN issues a user error abend code of 3918.

User response

Correct the error and rerun the job.

FABJ3919E: INCORRECT DFSMDA MEMBER: *member*

Explanation

The member *member* is loaded as a DFSMDA member, but it does not have a correct DFSMDA format. The eye catcher 'MDA' is not found in the member.

System action

Program FABJMAIN issues a user error abend code of 3919.

User response

Correct the error and rerun the job.

FABJ3920E: DD: *ddname* INFORMATION OF DB: *database* IS NOT FOUND IN DFSMDA MEMBER

Explanation

The DD information associated with the ddname *ddname* is not found in the DFSMDA member. IMS HP Image Copy attempted to allocate the *ddname* DD for the database *database*.

System action

Program FABJMAIN issues a user error abend code of 3920.

User response

Correct the error and rerun the job.

FABJ3921E: INVALID IMS RELEASE LEVEL LIBRARY IS USED

Explanation

The executed version of IMS is not supported by IMS HP Image Copy.

System action

Program FABJDMP0 or FABJRDB0 issues a user error abend code of U3921.

User response

Check the IMS SDFSRESL level of your executing environment. Correct the JCL and rerun the job.

FABJ3922E: CATALOG FAILED FOR STACK DATA SET OF DD: *ddname* DBD: *dbdname* DDN/AREA: *ddname* RC=*nnnn* R0=*nnnnnnnn* R1=*nnnnnnnn*

Explanation

Executing the CATALOG macro for the STACK data set DD (*ddname*) failed.

System action

If image copy process, program FABJMAIN ignores this error and continues processing. If create image copy process, program FABJMAIN issues a user error abend code of U3922.

User response

Check the return code from the CATALOG macro by referring to the DFDSS CATALOG macro publications, and catalog the image copy data set.

FABJ3923E: *macro* ERROR DDNAME=*ddname* RC=*rc* RSN=*rsn*

Explanation

The *macro* macro for DD name *ddname* failed with RC *rc* and RSN *rsn*.

System action

Program FABJMAIN issues a user error abend code of U3923.

User response

Contact IBM® Software Support.

FABJ3924E: INVALID LOCAL TIME OFFSET FROM UTC DETECTED

Explanation

The specified ZONE OFFSET does not exist.

System action

Program FABJMAIN issues a user error abend code of U3924.

User response

Ensure that the zone offset you specified for TIMESTMP is correct. If it is not, correct it and rerun the job.

FABJ3925E: LOAD-MODULE *module* IS NOT REENTRANT

Explanation

The load module *module* must be re-entrant but the attribute of the loaded module is not re-entrant.

System action

Program FABJDMP0 or FABJRDB0 issues a user error abend code of U3925.

User response

Ensure that the attribute exists in the IMS HP Image Copy load module library. If it does not exist in the library, relink the load module and rerun the job.

FABJ3926E: NONZERO RETURN CODE FROM IDENTIFY RC=*nnnn*

Explanation

The IDENTIFY macro for FABJDMP*n* failed.

System action

Program FABJMAIN issues a user error abend code of U3926.

User response

Ensure that the IMS HP Image Copy load module library is correct. If it is not correct, contact IBM® Software Support.

FABJ3927I: THE NON-RECOVERABLE DBDS DETECTED DB/PART NAME=*dbdname* DD/AREA=*ddname*

Explanation

The status of the database specified for recovery in the RECON is NON-RECOVERABLE.

System action

Program FABJMAIN continues processing.

User response

After the recovery processing, confirm the presence of the recovered database in the IMS HP Image Copy Recovery Utility report.

FABJ3928E: TIMEOUT OCCURRED FOR WAITING DATASET DSN: *dsn* RC: *nn* RSN: *nnnnnnnn*

Explanation

The dynamic allocation on the tape unit was not successful because the operation exceeded the WAITTIME.

System action

Program FABJMAIN issues a user error abend code of U3928.

User response

Rerun the job.

FABJ3929A: WAITING FOR DATASET DSN: *dsname*

Explanation

IMS HP Image Copy retries dynamic allocation on the tape unit or the tape label.

System action

Program FABJMAIN continues processing.

User response

None.

FABJ3930W: TIMESTMP=LASTIC IS REQUIRED FOR TIMECHK=NO TIMECHK WAS IGNORED

Explanation

TIMECHK=NO is specified. However, because TIMESTMP=LASTIC or TIMESTMP=LASTICALL is not specified, TIMECHK=NO is ignored. TIMECHK=NO must be specified with TIMESTMP=LASTIC or TIMESTMP=LASTICALL.

System action

Program FABJMAIN continues processing with TIMECHK=YES.

User response

If you want to rerun the job with TIMECHK=NO, specify TIMESTMP=LASTIC or TIMESTMP=LASTICALL and rerun the job.

FABJ3931E: VOLSER= IS REQUIRED FOR VOLSER2 KEYWORD

Explanation

A VOLSER2 keyword is specified in the GLOBAL/GROUP/IC statement, but no VOLSER keyword for the primary IC data set is specified.

System action

Program FABJMAIN stops processing with a return code of 16.

User response

Specify the VOLSER keyword for the primary image copy data set, and rerun the job.

FABJ3932E: STACK DDNAME COMBINATION CAN NOT BE CHANGED

Explanation

The combination of the stack DD name is changed. It must not be changed.

System action

Program FABJMAIN issues a user error abend code of 3932.

User response

Correct the error and rerun the job.

FABJ3933E: SUBTASK PROCESS FAIL. IC STEP CAN NOT CONTINUE

Explanation

IMS HP Image Copy main task ended due to an error in a subtask.

System action

Program FABJMAIN issues a user error abend code of 3933.

User response

Check the ABEND code for the subtask that ran before U3933 was issued, and correct the error cause.

FABJ3934E: MAINTASK FAILED TO ATTACH SUBTASK *subtask*

Explanation

An attempt by the ATTACH macro to attach subtask *subtask* failed.

System action

The Image Copy function ends with an abend code of 3934.

User response

Correct any obvious errors and rerun the job. If the problem persists, contact IBM® Software Support.

FABJ3935E: MAINTASK FAILED TO DETACH SUBTASK *xxxxxxxx*

Explanation

An internal error has occurred.

System action

Program FABJMAIN issues a user error abend code of 3935.

User response

Contact IBM® Software Support.

FABJ3937W: DBRC LIST COMMAND FAIL. UNABLE TO OBTAIN BOTH THE USID AND THE STOPTIME INFORMATION FROM DBRC.

Explanation

IMS HP Image Copy created image copy data sets successfully but it failed to report some fields of the created image copy data sets.

System action

Program FABJMAIN continues processing without reporting some fields of created image copy data sets. The return code of the process is 04.

User response

Identify the fields that are not reported in the ICERPRT data set and check those fields by using the IMS LIST.RECON command.

FABJ3938E: DEFINE GDG FAILED. IDCAMS RETURNED ABNORMAL CONDITION CODE.

Explanation

IDCAMS failed in defining a generation data group. The reason code is shown in the IDCAMS messages in the ICEPRINT data set.

System action

Program FABJMAIN issues a user error abend code of 3938.

User response

Check the IDCAMS messages, correct any errors, and rerun the job.

FABJ3939E: [SHADOW DATA SET | IMAGE COPY DATA SET] DELETE FAILED. IDCAMS RETURNED ABNORMAL CONDITION CODE.

Explanation

IDCAMS failed to delete a target data set. The reason code is shown in the IDCAMS messages in the ICEPRINT data set.

System action

Processing ends with a return code of 8.

User response

Locate the IDCAMS messages, correct any errors, and delete the data set manually.

FABJ3940E: FLASHCOPY INTENDED, SELECTED IC HAS A DIFFERENT DSNAME=*dsname*

Explanation

The FlashCopy® process was requested in CRC, but the specified image copy data set was not created by the Advanced Image Copy Services.

System action

Program FABJMAIN issues a user error abend code of 3940.

User response

Check the input image copy data set, and rerun the job.

FABJ3941E: FLASHCOPY INTENDED, RECONS MISSING, OR DBRC=*N* IS SET.

Explanation

Though FlashCopy® is intended, DBRC=N is specified or RECON data sets are missing.

System action

Process ends with a return code of 8.

User response

Correct the error and rerun the job.

FABJ3942E: IGWARLS RETURNS AN UNEXPECTED ERROR RETURN CODE AND REASON CODE. RC=*rc* RSN=*rsn*

Explanation

IMS HP Image Copy received an unexpected error return code and reason code from the DFSMS module, IGWARLS.

System action

Program FABJMAIN issues a user error abend code of 3942.

User response

Contact IBM® Software Support.

FABJ3943E: A SYSTEM ABEND WAS DETECTED BECAUSE INCORRECT SVC NUMBER *nnn* IS USED. SUBSYSTEM RECORD SSID=*ssid* MAY REMAIN IN DBRC.

Explanation

The system detected an incorrect type 2 supervisor call (SVC) number (*nnn*). The type 2 SVC number that is defined in the IMS Installation Defaults module (DFSIDEF0) does not match the SVC number in the IMS system. The SUBSYS record for the IMS subsystem ID (*ssid*) might remain in the DBRC RECON data sets.

System action

The Image Copy function ends with an abend code of 3943.

User response

Specify a correct type 2 SVC number by using the DFSIDEF macro of the DFSIDEF0 module and rebuild the DFSIDEF0 module. Also, run the LIST.SUBSYS SSID(*ssid*) command of DBRC and check whether the subsystem record exists or not. If the record remains in the DBRC RECON data sets, delete the record by issuing the following commands:

CHANGE.SUBSYS SSID(*ssid*) STARTRCV
CHANGE.SUBSYS SSID(*ssid*) ENDRECOV
DELETE.SUBSYS SSID(*ssid*)

FABJ3944E: IMS MANAGED ACBS CANNOT BE USED DUE TO GEX$CATQ FUNCTION=[OPEN | GET | CLOSE] RC=*xx* RSN=*yy*

Explanation

An error occurred in the indicated GEX$CATQ function. The indicated GEX$CATQ function could not use the IMS catalog directory. For the reason of the error, see the preceding GEX messages that were issued by GEX$CATQ.

System action

IMS HP Image Copy ends with an abend code of 3944.

User response

This message accompanies other warning or error messages. Follow the directions in the user response sections of the accompanying messages.

FABJ3945E: IMS MANAGED ACBS CANNOT BE USED DUE TO HPSCCATI FUNC=INFOHLQ RC=*rc* RSN=*rsn* INFO=*nn*

Explanation

Received an error from the HPSCCATI API. *rc* and *rsn* are the return code and the reason code from the HPSCCATI API.

The meanings of the codes are as follows:

RC=04:

- RSN=10040104: The IMS Catalog Definition exit routine (DFS3CDX0) module is not found in the STEPLIB. Ensure that the library containing the exit routine is included in the STEPLIB concatenation.
- RSN=10040108: CATALOG=NO is returned from the IMS Catalog Definition exit routine. Ensure that the settings in the exit routine are correct.
- RSN=1004010C: ACBMGMT=ACBLIB is returned from the IMS Catalog Definition exit routine. Ensure that the settings in the exit routine are correct.

RC=08:

- RSN=10080204: Failed to load the DFSBSCD0 module. Ensure that this module is included in the STEPLIB concatenation.
- RSN=10080208: Failed to load the DFSVC000 module. Ensure that this module is included in the STEPLIB concatenation.
- RSN=1008020C: Failed to load the DFS3CDX0 exit. Ensure that the Catalog Definition exit module is included in the SETPLIB concatenation.
- RSN=10080210: Received an error from the DFS3CDX0 exit. Ensure that the logic of your Catalog Definition exit routine is correct.

System action

IMS HP Image Copy ends with an abend code of 3945.

User response

Follow the instructions in the Explanation section. If the return code or the reason code is not listed in the Explanation section, contact IBM Software Support.

FABJ3946E: DBD=*name* CANNOT BE OBTAINED FROM IMS CATALOG

Explanation

The job is run in an IMS-managed ACBs environment. The indicated DBD could not be obtained from the IMS catalog.

System action

IMS HP Image Copy issues a user abend code of 3946.

User response

Ensure that the indicated DBD exists in the IMS catalog.

FABJ3950E: PARTITION NAME IS NOT REGISTERED FOR PARTITIONED DATABASE. DB NAME=*dbname* PART=*partname*

Explanation

The partition name is not registered to DBRC.

System action

Program FABJMAIN issues a user error abend code of 3950.

User response

Correct the error and rerun the job.

FABJ3951E: ILE DATASET SPECIFIED. PART NAME=*partname* DD NAME=*ddname*

Explanation

Image copy is needed for the ILE data set.

System action

Program FABJMAIN issues a user error abend code of 3951.

User response

Remove the IC/CIC statement for the ILE data set, and rerun the job.

FABJ3952E: PRIMARY INDEX FOR PHIDAM SPECIFIED. PART NAME=*part* DD NAME=*ddname*

Explanation

The specified DD name (*ddname*) is for an index data set of PHIDAM database. Image copy of PHIDAM index data set cannot be taken or be recovered by the recovery utility.

System action

Program FABJMAIN ends with an abend code of 3952.

User response

Ensure that the DD name specified is correct.

FABJ3953E: NO PARTITIONS ARE REGISTERED IN RECON FOR THE DATABASE. DB=*dbdname*

Explanation

The indicated master DBD of HALDB is not registered in DBRC.

System action

Program FABJMAIN ends with an abend code of 3953.

User response

Check the master DBD name and the RECON data set. Then, correct the ICEIN statement keyword, and rerun the job.

FABJ3954E: PART= KEYWORD SPECIFIED BUT DB ORGANIZATION IS NOT PARTITIONED DATABASE

Explanation

A registered database in GROUP *grpname* is either ILE or of an unrecognized database organization.

System action

Program FABJMAIN ends with an abend code of 3954.

User response

Check the DBD name. Then, correct the ICEIN statement keyword, and rerun the job.

FABJ3955E: DBRC=Y REQUIRED FOR PARTITIONED DATABASE DB=*dbdname*

Explanation

The database organization of the specified DBD is HALDB, but DBRC=N is specified. DBRC=Y is required when processing HALDB.

System action

Program FABJMAIN ends with an abend code of 3955.

User response

Rerun the job with DBRC=Y.

FABJ3957E: DBRC DB RECORD NOT FOUND FOR DB NAME=*dbdname*

Explanation

The specified DBD name or PART name is not found in the DBRC records.

System action

Program FABJMAIN ends with an abend code of 3957.

User response

Check the DBD name and the RECON data set. Correct the specification and rerun the job.

FABJ3958E: DBRC DB RECORD NOT PARTITIONED DATABASE FOR DB NAME=*dbdname*

Explanation

The database organization of *dbdname* is not registered as HALDB.

System action

Program FABJMAIN ends with an abend code of 3958.

User response

Check the DBD name and the database organization. Correct specification and rerun the job.

FABJ3959E: DATA SET DD NAME=*ddname* NOT FOR PARTITIONED DB FOR DB NAME=*dbdname*

Explanation

There is a conflict between the database organization of *ddname* and *dbdname*.

System action

Program FABJMAIN ends with an abend code of 3959.

User response

Check the DD and DBD organization. Correct the specification and rerun the job.

FABJ3960E: NO VALID DBDS MEMBERS TO PROCESS IN GROUP NAME=*dbdsgroup*

Explanation

All databases registered in DBDSGROUP are index data sets of PHIDAM or ILE data sets.

System action

Program FABJMAIN ends with an abend code of 3960.

User response

Check the DBDS Group name. Correct the specification and rerun the job.

FABJ3961E: DSPSERV [CREATE | DELETE] FAILED. RC=*xx* RSN=*xxxxxxxx*

Explanation

An attempt to create or delete DSPSERV failed. The contents of the general-purpose registers 15 and 0 are shown.

System action

Program FABJMAIN issues a user error abend code of 3961.

User response

Correct the error and rerun the job.

FABJ3962E: ALESERV [ADD | DELETE] FAILED. RC=*xx*

Explanation

An attempt to add or delete ALESERV failed. The contents of the general-purpose registers 15 and 0 are shown.

System action

Program FABJMAIN issues a user error abend code of 3962.

User response

Correct the error and rerun the job.

FABJ3963E: NAME/TOKEN *nnnnnnnn* FAILED. NAME=*XXXXXXXXXXXXXXXX* RC=*XX*

Explanation

An internal NAME/TOKEN *nnnnnnnn* Service error occurred.

System action

Program FABJMAIN issues a user error abend code of 3963.

User response

Contact IBM® Software Support.

FABJ3964E: DATA SPACE INDEX ENTRY NOT FOUND. DBD=*dbdname* DD=*ddname*

Explanation

There is no entry in the index table at the head of the Data Space.

System action

Program FABJMAIN issues a user error abend code of 3964.

User response

Contact IBM® Software Support.

FABJ3965E: LOAD/DELETE FAILED FOR MODULE: *module*

Explanation

The requested module *module* is not found in the loadable library, or the requested module *module* is not successfully deleted.

System action

The Image Copy function ends with an abend code of 3965.

User response

Ensure that the execution library is correctly concatenated to the STEPLIB or the JOBLIB DD statement. Then, rerun the job.

FABJ3966E: DBRC=Y REQUIRED FOR THE HPIC CONCURRENT IMAGE COPY FUNCTION.

Explanation

DBRC=Y must be specified when processing the IMS HP Image Copy concurrent image copy.

System action

Program DFSUDMP0 ends with an abend code of 3966.

User response

Rerun the job with DBRC=Y.

FABJ3970E: MULTI TARGET SELECTION INTERNAL ERROR FOR: *function*

Explanation

An internal error occurred in an internal function (*function*) of IMS HP Image Copy.

System action

Program FABJMAIN issues a user error abend code of 3970.

User response

Contact IBM® Software Support.

FABJ3971E: SPECIFIED AREA IS NOT FOUND

Explanation

An AREA keyword is specified, but no DEDB area was found that matches the specified value.

System action

Program FABJMAIN issues a user error abend code of 3971.

User response

Check the DBD and specify the correct value for the AREA keyword and rerun the job.

FABJ3972E: OPEN [FABJDFSP | DFSPRINT] FAILED.

Explanation

An attempt to open the data set that is associated with the FABJDFSP DD or the DFSPRINT DD failed. IMS HP Image Copy cannot write its processing messages to the data set that is specified by the DFSPRINT DD.

System action

Program FABJMAIN ends with an abend code of 3972.

User response

Contact IBM® Software Support.

FABJ3973E: CATALOG SEARCH INTERFACE IS INCOMPLETED. RC=*rc* RSN=*rsn*

Explanation

IMS HP Image Copy received a non-zero return code from the Catalog Search interface module.

System action

Program FABJMAIN issues a user error abend code of 3973.

User response

Contact IBM® Software Support.

FABJ3974E: MODULE *module* CANNOT BE LOADED. RC=*nnnnnnnn*

Explanation

The indicated load module exists in one of the loadable libraries but it cannot be loaded.

System action

Program FABJMAIN issues a user error abend code of 3974.

User response

Contact IBM® Software Support.

FABJ3975E: DBD *dbdname* IS NOT FOUND

Explanation

The indicated database is not found in the IMS catalog.

System action

Program FABJMAIN ends with an abend code of 3976.

User response

Locate message FABJ3976E and correct any errors.

FABJ3976E: RELATED DBD OF DBD *input_dbdname* IS NOT FOUND IN IMS CATALOG

Explanation

IMS HP Image Copy failed to load DBDs that are related with DBD *input_dbdname* from the IMS catalog. Related DBDs are necessary to perform HASH Pointer Check on full-function databases.

System action

Program FABJMAIN ends with an abend code of 3976.

User response

Ensure that information of related DBDs is stored in the IMS catalog. See message FABJ3975E for the names of related DBDs.

FABJ3977E: AN ERROR OCCURRED IN FABPHEXM FUNC=*func* RC=*rc* RSN=*rsn*

Explanation

The indicated function of FABPHEXM ended with an error. RSN and RC show the reason code and the return code.

System action

IMS HP Image Copy ends with an abend code of 3977.

User response

Contact IBM Software Support.

FABJ3999E: UNKNOWN ERROR OCCURRED IN *module* MODULE (CC=*n*)

Explanation

An unknown error occurred in the IMS HP Image Copy module named *module* with condition code (CC) *n*.

System action

IMS HP Image Copy issues a user error abend code of 3999.

User response

Contact IBM® Software Support.

FABJ4021W: HASH CHECK FUNCTION CANNOT BE USED WITHIN CONCURRENT IMAGE COPY

Explanation

The HASH Check function is ignored in concurrent image copy process. This message does not affect the CIC process.

System action

IMS HP Image Copy continues processing.

User response

None.

FABJ4022W: HASH CHECK FUNCTION IS IGNORED FOR DBD=*dbdname* DD=*ddname*

Explanation

The program DFSUDMP0 is invoked as an MVS™ batch program and HALDB is specified in the control statement. But the ULU region is required to process HALDB. *dbdname* is the database name specified in the control statement. *ddname* is the ddname specified in the control statement.

System action

Processing continues without the HASH Check process.

User response

Modify the JCL to use the ULU region. If necessary, rerun the job.

FABJ4095E: RECON ACCESS FAILED. *description*

Explanation

An error was detected in RECON access processing. *description* provides additional information about the error:

- DBRC LIST COMMAND IS NOT COMPLETED. RC=*xxxxxxxxx*
- SYSPRINT DD FOR DBRC LIST COMMAND IS SPECIFIED AS DUMMY
- INTERNAL ERROR OCCURRED
- FUNC=*fffffffff* RETURN CODE=*xxxxxxxxx* REASON CODE=*xxxxxxxxx* KEYS: DBD=*dbdname* DDN=*ddname* KEYTYPE=*xxxxxxxxxxxxx*
- FUNC=*fffffffff* RETURN CODE=*xxxxxxxxx* REASON CODE=*xxxxxxxxx*
- FUNC=*fffffffff* TYPE=*tttttttt* DBD=*xxxxxxxxx* RETURN CODE=*xxxxxxxxx* REASON CODE=*xxxxxxxxx*

System action

IMS HP Image Copy issues a user abend code of 4095.

User response

Correct the error and rerun the job.

FABJ4100I: CHECKPOINT RESTART PROCESS COMPLETED, CHECKPOINT FILE IS IN *next_job_status* MODE.

Explanation

This informational message is issued when the Checkpoint Restart process completes.

System action

This message indicates the state of the checkpoint file. Generally, it reflects the final return code from IMS HP Image Copy or for RESTART=N.

User response

None. This message is informational.

FABJ4101I: USING CHECKPOINT FILE *ddname*

Explanation

This informational message provides the ddname of the checkpoint file.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4102I: PROCESSING (CHECK) RECORD IMAGE

Explanation

This informational message indicates the internal image copy processing (SYSIN) record image created during a CHECK call phase.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4103I: *text*

Explanation

IMS HP Image Copy generates the record image associated with other messages such as FABJ4102I. *text* represents the image copy SYSIN record image.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4104I: IMAGE COPY PROCESS WILL NOT BE RESTARTED BECAUSE IT WAS COMPLETED SUCCESSFULLY IN THE PREVIOUS RUN

Explanation

Processing of the image copy SYSIN record that references messages FABJ4102I and FABJ4103I was bypassed.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4105I: PROCESSING (MARK) RECORD IMAGE

Explanation

This informational message indicates processing of the internal image copy (SYSIN) record image during a CHECK call phase.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4107E: HEADER COUNT IS NEGATIVE

Explanation

A severe error occurred. An internal problem is found in the Checkpoint Restart header record.

System action

The checkpoint file is probably corrupted. No further checkpoint or restart must be done using the current checkpoint file.

User response

Do not use this file for Checkpoint Restart processing. If the problem persists, contact IBM® Software Support for assistance.

FABJ4109E: THE CHECKPOINT FILE IS NOT DEFINED CORRECTLY

Explanation

This checkpoint file has an invalid definition. Ensure that the checkpoint file is not defined as SYSIN, SYSOUT, terminal, or UNIX® system file type, and that the specification is correct. The cause can be:

- DISP=MOD is not specified
- RECFM=VB is specified
- LRECL=4096 or greater
- DSORG=PS is specified

System action

The Checkpoint Restart process is placed in inactive mode.

User response

Redefine the checkpoint file with an appropriate file type.

FABJ4110E: RDJFCB MACRO FOR THE CHECKPOINT FILE HAS FAILED.

Explanation

A problem occurred trying to read internal information about the checkpoint file.

System action

The Checkpoint Restart process is placed in inactive mode.

User response

Contact IBM® Software Support.

FABJ4112E: THE CHECKPOINT FILE COULD NOT BE OPENED.

Explanation

Invalid file access was defined for the checkpoint file. The file could not be opened for processing.

System action

The Checkpoint Restart process is placed in inactive mode.

User response

Ensure that the checkpoint file is defined correctly and that it can be accessed under QSAM for I/O.

FABJ4114E: INCORRECT RECORD WAS DETECTED IN THE CHECKPOINT FILE.

Explanation

A bad record in the checkpoint file was detected. The problem can be either a bad type or a bad length. The checkpoint file is probably corrupted.

System action

The Checkpoint Restart process is placed in inactive mode.

User response

Do not use this file for Checkpoint Restart processing. If the problem persists, contact IBM® Software Support.

FABJ4115E: TWO OR MORE HEADERS EXIST ON THE CHECKPOINT FILE.

Explanation

More than one header record was found in the checkpoint file. At most, there must be only one active header record.

System action

The Checkpoint Restart process is placed in inactive mode.

User response

Do not use this file for Checkpoint Restart processing. Contact IBM® Software Support for assistance.

- RECFM=VB
- LRECL=4096 or greater
- DSORG=PS

FABJ4119W: DUMMY IS SPECIFIED ON THE CHKPTDD DD STATEMENT. THE CHECKPOINT RESTART FUNCTION IS DISABLED.

Explanation

The JCL specifies a dummy, `//CHKPTDD DD DUMMY`, for the checkpoint file. There is no requirement that the checkpoint file ddname, CHKPTDD, be defined. Its use is optional. If the ddname is missing, then the Checkpoint Restart process will be inactive.

System action

Processing continues.

User response

Correct the field value.

FABJ4121E: THE ICEIN CONTROL STATEMENT IS DIFFERENT FROM THE INFORMATION IN THE CHECKPOINT FILE.

Explanation

This message indicates that an unequal field value was detected during the VERIFY function between a P type class element entry and its associated F type class element entry.

The image copy commands between the time of the checkpoint and the restart were changed. An entry was either deleted, added, or updated. All scheduled Checkpoint Restart processing for the same image copy database set must match.

Message FABJ4122I contains additional information.

System action

The Checkpoint Restart process is placed in inactive mode.

User response

Ensure that the image copy database set, as specified on the ICEIN file, remains consistent across Checkpoint Restart invocations.

FABJ4122I: INCONSISTENT FIELD: *field_name*

Explanation

This message is associated with message FABJ4121E. *field_name* represents the name of the field found to be unequal.

System action

The Checkpoint Restart process is placed in inactive mode.

User response

None. This message is informational.

FABJ4123E: INTERNAL ERROR WAS DETECTED IN CHECKPOINT RESTART PROCESS. RC=*rc* RSN=*rsn*

Explanation

Checkpoint Restart processing cannot continue because of an internal error.

System action

IMS HP Image Copy stops Checkpoint Restart processing with a return code of 16.

User response

Contact IBM® Software Support.

FABJ4127I: IMAGE COPY NOT SUCCESSFUL LAST TIME, MUST START FROM THE BEGINNING

Explanation

This informational message indicates that the image copy bypass will not occur because the last image copy process was not completed successfully. This message is generated because in the last run, either the image copy ended prior to completion, or the image copy encountered a problem.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4128I: IMAGE COPY PROCESS WILL NOT BE RESTARTED BECAUSE *reason*

Explanation

The image copy process was bypassed for the database data set that is shown in messages FABJ4102I and FABJ4103I. *reason* shows one of the following texts:

- A SEVERE POINTER ERROR WAS FOUND IN THE PREVIOUS RUN.
- RELATED DBDS HAS A SEVERE POINTER ERROR IN THE PREVIOUS RUN.

System action

IMS HP Image Copy continues processing other database data sets.

User response

Determine the cause of the database errors by referring to the HD Pointer Checker reports or the DEDB Pointer Checker report that were generated in the previous run. If necessary, repair the database.

FABJ4129I: HASH CHECK IS INCOMPLETE. THIS DB IS TO BE RESTARTED.

Explanation

IMS HP Image Copy canceled the HASH Check process because it detected errors while creating image copy data sets. This database will be reprocessed in the next restart process.

This message is issued only when RESTART=(Y,HASH) is specified.

System action

IMS HP Image Copy continues processing other database data sets.

User response

None. This message is informational.

FABJ4130I: IMAGE COPY PROCESS WAS ATTEMPTED, BUT IT WAS NOT PROCESSED BECAUSE RELATED DBDS HAS FAILED TO CREATE AN IMAGE COPY.

Explanation

This message indicates that the attempted image copy is bypassed because a related image copy had been failed.

System action

A future restart will attempt the image copy.

User response

None. This message is informational.

FABJ4131I: IMAGE COPY PROCESS WAS ATTEMPTED, BUT IT DID NOT COMPLETE SUCCESSFULLY. THIS DBDS WILL BE REPROCESSED IN THE NEXT RUN.

Explanation

IMS HP Image Copy failed to create the image copy for the DBDS. The DBDS will be reprocessed in the next run.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4132E: INCONSISTENT IMAGE COPY CHECKPOINT/RESTART ENVIRONMENT

Explanation

This situation occurs when there is an inconsistency in structure between the Checkpoint Restart program definitions and the format of the Checkpoint Restart data set.

System action

The full image copy request is processed. No indication is placed in the checkpoint file.

User response

You can either delete and reallocate the checkpoint file, or delete all the file records.

FABJ4133I: CHECKPOINT RESTART OPTION *option*

Explanation

This informational message indicates the processing state, compile, and execution time of the Checkpoint Restart program. *option* is the parameter that is selected to initialize Checkpoint Restart.

This message is generated when Checkpoint Restart is determined successfully in the initialization phase of the Checkpoint Restart program.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4134I: IMAGE COPY PROCESS WILL BE RESTARTED BECAUSE OF FAILURE IN THE PREVIOUS RUN.

Explanation

This message indicates that during a restart, this image copy will be reattempted because of a possible related image copy failure. The image copy might have completed previously. However, because of a related image copy failure, it will be reattempted. This message is followed immediately by message FAB4106I showing the image copy control statement.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4135I: THIS PROCESS IS RUNNING IN [CHECKPOINT | RESTART] MODE.

Explanation

This informational message displays the processing mode; either Checkpoint mode or Restart mode.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4136I: THIS IS THE [1ST | 2ND | 3RD | *nn*TH] PROCESS OF A RESTART.

Explanation

This message displays the number of times the Restart process is done.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4137I: THE RESTART COUNT HAS REACHED TO THE LIMIT. RESTART WILL NOT BE PROCESSED ANY MORE.

Explanation

The number of times the Restart processing was done has exceeded the limit that is specified by the RESTART keyword. Restart processing will no more be run, and the checkpoint file is reset.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4138I: PROCESSING (HECHK) RECORD IMAGE

Explanation

This message indicates the internal image copy processing (SYSIN) record image that is created during a HECHK call phase. In the HECHK call phase, IMS HP Image Copy checks whether HASH errors are found or not. This message is issued only when RESTART=(Y,HASH) is specified.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4139I: ERROR IN HASH CHECK. THIS DB IS TO BE RESTARTED.

Explanation

A HASH error has occurred in this DBDS. This database will be reprocessed at the next Restart processing. This message is issued only when RESTART=(Y,HASH) is specified.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4140E: A SEVERE POINTER ERROR IS FOUND. THIS DATABASE IS NOT TO BE RESTARTED.

Explanation

A severe pointer error is found in this DBDS: the database is damaged. This database will not be reprocessed in the next Restart processing. This message is issued only when RESTART=(Y,HASH) is specified.

System action

IMS HP Image Copy continues processing.

User response

Repair the database and rerun the job.

FABJ4141I: RELATED DBDS HAS A SEVERE POINTER ERROR: IC WILL NOT TO BE REATTEMPTED

Explanation

A severe pointer error is found in this DBDS or the related DBDS. The database will not be reprocessed in the next Restart processing. This message is issued only when RESTART=(Y,HASH) is specified.

System action

IMS HP Image Copy continues processing.

User response

Repair the database and rerun the job.

FABJ4142W: RSTTYPE IS DIFFERENT FROM THE PREVIOUS RUN.

Explanation

The value specified on the RSTTYPE keyword is different from the previous run.

System action

IMS HP Image Copy will create image copies of DBDSs that are determined to be reprocessed in the previous run. The specified value for the current run is used to determine the DBDSs that are to be reprocessed in the next run.

User response

None.

FABJ4143E: RSTTYPE_STK IS DIFFERENT FROM THE PREVIOUS RUN

Explanation

The value specified on the RSTTYPE_STK keyword is different from the previous run of the job. When using the Checkpoint Restart function, you must use the same JCL stream that you have used in the previous run.

System action

IMS HP Image Copy stops processing with a return code of 16.

User response

Correct the value on the RSTTYPE_STK keyword. If you want to change the value on the RSTTYPE_STK keyword, you must recreate the checkpoint file.

FABJ4144I: RSTTYPE_STK=(ALL,APPEND) IS REGARDED AS RSTTYPE_STK=(ALL,NEW)

Explanation

RSTTYPE_STK=(ALL,APPEND) is specified, however, IMS HP Image Copy processes the job as RSTTYPE_STK=(ALL,NEW).

System action

IMS HP Image Copy continues processing with RSTTYPE_STK=(ALL,NEW).

User response

None. This message is informational.

FABJ4162E: INVALID OR UNDEFINED IMS RELEASE LEVEL FOR FLASH COPY, IMS LEVEL=*xxxx*

Explanation

This message indicates that there is no definition for flash copy process defined for the current release. A 4067 abend follows.

System action

IMS HP Image Copy issues a user abend code of 4067.

User response

Specify the library in the STEPLIB DD statement correctly, and rerun the job.

FABJ4184E: GETBUFF/PUT FUNCTION FAILED FOR HPIO/OSAM

Explanation

Recovery using HP Input/Output was requested for an OSAM data set. HPIO GETBUFF/PUT function failed.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4185E: GETBUFF/PUT FUNCTION FAILED FOR HPIO/VSAM

Explanation

Recovery using HP Input/Output was requested for a VSAM data set. HPIO GETBUFF/PUT function failed.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4187W: PC INITIALIZATION ERROR. RECOVERY CONTINUES WITHOUT USING HPIO ENGINE

Explanation

Recovery using HP Input/Output was requested. Recovery starts using IMS JCL. No PC number can be created and used.

System action

The recovery process continues without using HP Input/Output.

User response

None.

FABJ4188E: POINT/WRITE FUNCTION FAILED FOR HPIO/VSAM

Explanation

An error occurred while HP Input/Output was processing a VSAM POINT or WRITE command.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4189E: OPEN FUNCTION FAILED FOR HPIO/VSAM

Explanation

An error occurred while HP Input/Output was processing a VSAM OPEN command.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4190E: POINT/WRITE FUNCTION FAILED FOR HPIO/OSAM

Explanation

An error occurred while HP Input/Output was processing an OSAM allocate buffer or WRITE command.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4191E: OPEN FUNCTION FAILED FOR HPIO/OSAM

Explanation

An error occurred while HP Input/Output was processing an OSAM OPEN command.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4192E: CLOSE FUNCTION FAILED FOR HPIO DATA SET

Explanation

An error occurred while HP Input/Output was processing a CLOSE data set command.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4195E: READ FUNCTION FAILED FOR HPIO/OSAM

Explanation

An error occurred while HP Input/Output was processing a READ data set command.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4196E: POINT (READ) FUNCTION FAILED FOR HPIO/OSAM

Explanation

An error occurred while HP Input/Output was processing a POINT for READ data set command.

System action

The recovery process fails.

User response

Review the error, check the data set allocation parameters, and rerun the job.

FABJ4197E: HPIO TERMINATION ERROR. RC=

Explanation

An error occurred while HP Input/Output was ending an image copy or recovery process.

System action

The image copy or recovery process completes.

User response

None.

FABJ4198E: HPIO INITIALIZATION ERROR. RC=

Explanation

An error occurred while HP Input/Output was initializing an image copy or recovery process.

System action

The image copy or recovery does not start.

User response

None.

FABJ4199E: APF AUTHORIZATION IS REQUIRED TO USE THE REQUESTED HPIC FUNCTION.

Explanation

APF authorization is needed to use the HP Input/Output interface, DFSMSdss™ API, or IMS Tools Online System Interface to generate image copy data sets or to recover a database.

System action

Program FABJMAIN or DFSURDB0 issues a user error abend code of 0199.

User response

Correct the error and rerun the job.

FABJ4201E: IMAGE COPY PROCESSING FOR DBD *dbdname* DDN/AREA [*ddname* | *areaname*] TERMINATED DUE TO AN ERROR IN DFSMSDSS API

Explanation

During FASTIC processing for the indicated resource, an error occurred in the DFSMSdss™ API causing the image copy to fail.

System action

The image copy request fails.

User response

Review the messages, correct the error, and rerun the job.

FABJ4211E: SECONDARY IMAGE COPY IS NOT ALLOWED FOR FASTIC= COPY PROCESSING

Explanation

Only a single output image copy data set can be created with FASTIC=COPY.

System action

The image copy request fails.

User response

Correct the error and rerun the job.

FABJ4213E: THE PROCESS OF CREATING SHADOW DATA SET IS FAILED. NO IC DATA SET IS CREATED.

Explanation

The shadow data set could not be created. IMS HP Image Copy ends without creating image copy from the shadow data set.

System action

IMS HP Image Copy stops processing.

User response

Contact IBM® Software Support and provide the return code and the reason code shown in the message.

FABJ4214E: COPY REQUEST FAILED DUE TO AN ERROR WITH ANOTHER IMAGE COPY ON THE STACK

Explanation

An image copy failed due to an error in another image copy that is being written on the same stack.

System action

Image copy processing will fail for all image copies on the stack.

User response

Correct the error and rerun the job.

FABJ4215E: ERROR DURING DFSMSDSS API PROCESSING FOR DBD *dbdname* DDN/AREA [*ddname* | *areaname*] RC=*rrrrrrrr*

Explanation

An error occurred while starting the DFSMSdss™ API for the indicated resource, which is used in the FASTIC processing. RC shows the DFSMSdss API return code in hexadecimal. The contents of the general-purpose register 15 is shown.

System action

Image copy processing fails.

User response

Review the messages, correct the error, and rerun the job.

FABJ4216E: NOTIFY.IC FAILED FOR DBD=*dbdname* DDN=*ddname*

Explanation

The NOTIFY.IC command for the FASTIC=COPY image copy has failed.

System action

The image copy for the database data set fails.

User response

Correct the error and rerun the job.

FABJ4217I: NOTIFY.IC SUCCESSFUL FOR DBD *dbdname* DDN/AREA *ddname*

Explanation

The NOTIFY.IC command for the FASTIC=COPY image copy was successful.

System action

The image copy is registered in the RECON data sets.

User response

None. This message is informational.

FABJ4218I: CHANGE.IC SUCCESSFUL

Explanation

The CHANGE.IC command for the specified database was successful.

System action

The FASTIC offload copy is registered as the secondary image copy in the RECON data set.

User response

None. This message is informational.

FABJ4219I: HPIC RECEIVED RC=4 FROM DFSMSDSS API FOR DBD *dbdname* DDN/AREA [*ddname* | *areaname*]. HPIC CONTINUES PROCESSING.

Explanation

The physical copy process for the indicated resource ended. However, IMS HP Image Copy received return code 4 from the DFSMSdss API.

System action

IMS HP Image Copy continues processing.

User response

Check the DFSMSdss message and the meaning of the return code. If necessary, correct the condition and rerun the job.

FABJ4220E: DUPLICATE DBD/DDN ENTRIES FOUND IN JOB STEP

Explanation

Duplicate entries were found while scanning the database data sets being image copied in the job step. A database data set can be image copied only once within a job step when FASTIC processing is used.

System action

The job step fails.

User response

Correct the error and rerun the job.

FABJ4221E: PROGRAM LOGIC ERROR - *reason*

Explanation

An internal error has occurred during image copy processing. The reason for the failure is listed.

System action

The image copy process fails.

User response

Contact IBM® Software Support.

FABJ4222E: DFSMSDSS *err_number* ERROR WAS DETECTED AFTER THE END OF IC PROCESS

Explanation

IMS HP Image Copy received DFSMSDSS *err_number* error message after the end of IC process.

System action

The image copy processing continues.

User response

Contact IBM® Software Support.

FABJ4223E: ERROR OCCURRED FOR THE FOLLOWING DATASET

SOURCE DSN: *input_data_set_name*

[TARGET DSN: *output_data_set_name*]

Explanation

IMS HP Image Copy encountered an error while processing a data set in the DFSMSdss API process or the EMC TimeFinder API process.

System action

The image copy process fails.

User response

Check the DFSMSdss message or the EMC Time Finder message that is related to input and output data sets.

FABJ4224W: LOGICAL COPY FAILED BUT PHYSICAL COPY CONTINUES BECAUSE *reason*

Explanation

Logical copy processing of the DFSMSdss DUMP command failed but IMS HP Image Copy continues with physical copy processing. *reason* shows either of the following texts:

- FASTIC=(PREF,DUMP)

- HPIC IS USING FASTIC=(PREF,DUMP) FOR THE OFFLOAD COPY PROCESS.

System action

The image copy processing continues.

User response

None.

FABJ4230E: ERROR RECOVERY ENTERED FOR DB/AREA *dbdname* DDN *ddname* DSN *data_set_name*

Explanation

An error occurred during DFSMSdss™ API processing associated with FASTIC processing.

System action

The image copy process fails.

User response

Contact IBM® Software Support.

FABJ4231E: ERROR IN COMMAND FOR DB/AREA *dbdname* DDN *ddname* DSN *data_set_name*

Explanation

An error occurred during DFSMSdss™ API processing associated with FASTIC processing.

System action

The image copy process fails.

User response

Contact IBM® Software Support.

FABJ4232E: CONCURRENT IMAGE COPY OF VSAM KSDS *data_set_name* NOT ALLOWED FOR FASTIC=COPY

Explanation

An attempt was made to perform concurrent image copy for a VSAM KSDS using FASTIC processing, which is not allowed.

System action

The image copy process fails.

User response

Correct the error and rerun the job.

FABJ4233I: PHYSICAL COPY COMPLETE FOR DB/AREA *dbdname* DDN *ddname* DSN *data_set_name*

Explanation

Physical copy processing has completed for the specified database data set using FASTIC processing.

System action

Processing of the image copy continues.

User response

None. This message is informational.

FABJ4234I: PHYSICAL COPY FAILED FOR DB/AREA *dbdname* DDN *ddname* DSN *data_set_name*

Explanation

Physical copy processing has failed for the specified database data set using FASTIC processing.

System action

The image copy process fails.

User response

Correct the error and rerun the job.

FABJ4235I: FASTREP COPY COMPLETE FOR DBD *dbdname* DDN/AREA *ddname* DSN *data_set_name*

Explanation

During FASTIC processing, the database data set was copied using either SnapShot Copy or FlashCopy®. Both logical and physical copy processing is complete.

System action

Processing of the image copy continues.

User response

None. This message is informational.

FABJ4237I: LOGICAL COPY COMPLETE FOR DBD *dbdname* DDN/AREA *ddname* DSN *data_set_name*

Explanation

Logical copy processing has completed for the specified database data set using FASTIC processing.

System action

Physical copy processing of the database data set is performed

User response

None. This message is informational.

FABJ4238E: LOGICAL COPY FAILED FOR DB/AREA *dbdname* DDN *ddname* DSN *data_set_name*

Explanation

Logical copy processing, using FASTIC processing, for the specified database data set has failed.

System action

If FASTIC=(PREF,DUMP) was specified, image copy continues processing. Otherwise, image copy processing fails.

User response

Correct the error and rerun the job.

FABJ4239I: PHYSICAL COPY BEGIN FOR DBD *dbdname* DDN/AREA *ddname* DSN *data_set_name*

Explanation

Physical copy processing for the specified database data set has started for FASTIC processing.

System action

Physical copy processing begins.

User response

None. This message is informational.

FABJ4240E: DEDB CIC FAILED DUE TO EQE FOR DB/AREA *dbdname* DDN *ddname* DSN *data_set_name*

Explanation

A concurrent image copy was taken for a DEDB area, but the area contains errors (EQEs or EEQEs).

System action

The image copy processing fails.

User response

Correct the error and rerun the job.

FABJ4242I: MESSAGE ADR974I WAS ISSUED FOR DBD *dbdname* DDN *ddname* DSN *data_set_name*

Explanation

During FASTIC processing for a VSAM KSDS, DFSMSdss™ issued an ADR974I message for the database data set.

System action

The image copy processing continues.

User response

For a description of the ADR974I message, see *z/OS® System Messages*. Verify that the identified data set is valid.

FABJ4243E: VSAM KSDS DEFINITION FOR *data_set_name* DOES NOT ALLOW CONCURRENT IMAGE COPY

Explanation

During FASTIC=DUMP processing for a VSAM KSDS, it was determined that the definition of the data set does not allow backup-while-open processing. The DEFINE CLUSTER attribute, BWO(TYPEIMS), is not specified for the KSDS.

System action

Image copy processing fails.

User response

Use the IDCAMS ALTER command and specify BWO(TYPEIMS) for the KSDS, and rerun the job. For more information, see *DFSMS/MVS™ Access Method Services for the Integrated Catalog Facility*, SC26-4906.

FABJ4244E: IMAGE COPY PROCESSING TERMINATED DUE TO AN ERROR IN DFSTIMX MACRO, RC=*return code*

Explanation

During FASTIC processing, a call to the DFSTIMX macro resulted in an error.

System action

Image copy processing fails.

User response

Retry the job. If the problem persists, contact IBM® Software Support.

FABJ4245E: ATTEMPT TO CREATE CONCURRENT IC FOR DSN=*data_set_name* FAILED DUE TO BWO ERROR

Explanation

During concurrent image copy processing using FASTIC=DUMP processing, IMS HP Image Copy could not resolve CI/CA splits.

System action

Image copy processing fails.

User response

Retry the job or change the image copy process to batch image copy process and re-submit the job.

FABJ4246I: COMPRESSION PROCESSING IS IGNORED FOR FASTIC=*COPY* PROCESSING

Explanation

Compression processing (COMP=Y) is not supported for FASTIC=COPY processing.

System action

Ignores COMP=Y and continues image copy processing.

User response

None. This message is informational.

FABJ4248E: IMAGE COPY STACKING IS INVALID FOR FASTIC=COPY PROCESSING

Explanation

Image copy stacking is not supported when FASTIC=COPY.

System action

Image copy processing fails.

User response

Correct the error and rerun the job.

FABJ4250E: UNABLE TO LOCATE FCBLOCK AT *label*

Explanation

An internal error occurred during image copy processing. The reason for the failure is listed.

System action

Image copy processing fails.

User response

Contact IBM® Software Support.

FABJ4251I: OFFLOAD COPY BEGIN FOR DBD *dbdname* DDN/AREA *ddname* DSN *data_set_name*

Explanation

FASTIC offload copy processing began for the specified database data set.

System action

FASTIC offload copy processing continues.

User response

None. This message is informational.

FABJ4252I: OFFLOAD COPY COMPLETE FOR DBD *dbdname* DDN/AREA *ddname* DSN *data_set_name*

Explanation

During FASTIC offload copy processing, Fast Recovery image copy was created for the specified database data set. The format of FASTIC offload copy is either in standard image copy format or Fast Recovery image copy format.

System action

Processing of the image copy continues.

User response

None. This message is informational.

FABJ4253E: OFFLOAD COPY FAILED FOR DBD *dbdname* DDN/AREA *ddname* DSN *data_set_name*

Explanation

FASTIC offload copy processing failed for the specified database data set.

System action

The image copy process fails.

User response

Correct the error and rerun the job.

FABJ4254E: CHANGE.IC FAILED

Explanation

The CHANGE.IC command for the specified database failed.

System action

The image copy process fails.

User response

Correct the error and rerun the job.

FABJ4255I: DFSMSDSS DUMP COMMAND RETRY FOR DB *dbdname* DDN *ddname*

Explanation

The concurrent image copy process with FASTIC=(,DUMP) processing of Advanced Copy Services is requested, and IMS HP Image Copy detected CI or CA splits in a database data set, which is a VSAM KSDS, during the logical copy phase of the concurrent copy process of DFSMSdss. IMS HP Image Copy retries the DFSMSdss DUMP command.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4260I: [LOGICAL COPY | COPY PROCESSING] COMPLETE FOR DB/AREA [*dbdname* | *partname* | *areaname*] [*failed_data_sets* OF *total_data_sets* DATA SETS FAILED]

Explanation

This message is issued during FASTIC processing when all the data sets of a database are released from the DFSMSdss process. This message is issued at the end of logical copy for all data sets of the database if the process is FASTIC=(*opt*,DUMP). Otherwise, it is issued at the end of physical copy.

This message shows the number of total data sets that were attempted for image copy in the job step (*total_data_sets*) and the number of data sets that failed (*failed_data_sets*) in either of the following processes:

- Logical copy in the FASTIC DUMP process
- Physical copy in the FASTIC COPY process or in the FASTIC FDUMP process

System action

Image copy processing continues.

User response

You can safely restart the indicated database.

FABJ4261I: COPIED/FAILED DB/AREA *cccccccc* DDN *dddddddd* DSN *ssssssss*

Explanation

FASTIC image copy is run for DB/AREA *cccccccc*, DDN *dddddddd*, DSN *ssssssss*.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4262I: END OF UNAUTHORIZATION PROCESS FOR [DBD | PART | AREA] =*name*

Explanation

DBD, PART, or AREA was released from IMS HP Image Copy processing. This message is issued only when the Advanced Image Copy Services is used (when FASTIC keyword other than FASTIC=N is specified), and is shown on the console at the end of logical copy process for each DBD, PART, or AREA that is registered to DBRC. After this message, other programs can be started for the indicated DBD, PART, or AREA.

System action

IMS HP Image Copy continues processing.

User response

You can safely restart the indicated database.

FABJ4263I: ALL DATABASES WERE RELEASED FROM HPIC PROCESS

Explanation

All databases used by the image copy process were released from IMS HP Image Copy and have become available for other programs. This message is shown on the console when the logical copy process or other unauthorization process for all databases is finished. For example, if IMS HP Image Copy failed in the logical copy process, but succeeded in the physical copy process, this message is issued at the end of physical copy process.

After this message, other programs can be started for all databases. If some errors are found in image copy processing, message FABJ4264W is issued instead of this message.

This message does not guarantee the success of the image copy process.

System action

IMS HP Image Copy continues processing.

User response

You can safely restart all the target databases.

FABJ4264W: ALL DATABASES WERE RELEASED FROM HPIC PROCESS, BUT SOME PROCESSES WERE FAILED

Explanation

This message is shown instead of FABJ4263I when some errors are found in the image copy processing.

System action

IMS HP Image Copy continues processing.

User response

Check the error messages issued before this message, and, if needed, correct the error and rerun the job.

FABJ4290I: FABJFCAI LINK TO ADRXMAIA

Explanation

IMS HP Image Copy has passed control to ADRXMAIA (the DFSMSdss™ cross-memory application programming interface).

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4291I: FABJFCAI RETURN FROM ADRXMAIA

Explanation

IMS HP Image Copy has received control from ADRXMAIA (the DFSMSdss™ cross-memory application programming interface).

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4292E: ERROR RECOVERY ENTERED FOR FABJDFCN

Explanation

An error occurred in the FASTIC processing program.

System action

FABJDFCN will attempt to continue image copy processing.

User response

None.

FABJ4294I: HP IMAGE COPY RETURN FROM EMCSNAP [RC=00000004]

Explanation

IMS HP Image Copy received control from EMCSNAP.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4295E: HP IMAGE COPY RETURN FROM EMCSNAPI RC=*nnnnnnnn* FOR [DBD=*dbdname* DDN=*ddname* | DBD=*master_dbdname* PART=*partition_name* DDN=*ddname* | DBD=*dbdname* AREA=*areaname*]

Explanation

IMS HP Image Copy received an error from EMCSNAP of EMC TimeFinder. RC indicates the return code from EMCSNAP.

System action

The image copy process fails.

User response

Check the messages, correct the error, and rerun the job.

FABJ4600E: HPIC FORCES TO STOP IMAGE COPY PROCESSES

Explanation

One or more errors occurred in image copy processing. All the image copy processes are forced to stop because IC_ERROR=STOP is specified.

System action

All image copy processes terminate.

User response

Check for other error messages, correct the errors, and rerun the job.

FABJ4602E: DBRC QUERY FOR DBD/PART/AREA=*cccc* FAILED. FABDAI RSN=*nnnn*. ALL IC FOR THIS DBD/PART/AREA NOT PERFORM

Explanation

An attempt to query DBRC RECON data sets for DBD information has failed.

System action

If FALLBACK=Y is specified, IMS HP Image Copy continues to process this DBD. Otherwise, IMS HP Image Copy skips this DBD and starts processing the next DBD.

User response

Contact IBM® Software Support, and provide the RSN shown in the message.

FABJ4603E: TOSI API INIT ERROR RC=*nnnn* RSN=*nnnn*. IC PROCESS ABEND U4000 RSN=03

Explanation

An attempt to initialize IMS Tools Online System Interface service has failed. This message indicates an internal processing error.

System action

IMS HP Image Copy abends with U4000 RSN=03

User response

Contact IBM® Software Support, and provide the RC and RSN found in the message and dump.

FABJ4604E: TOSI SERVER LIST IS NOT FOUND. TOSI CONNECT PROCESS INTERNAL LOGIC ERROR. IC PROCESS ABEND U4000 RSN=04

Explanation

TOSI server list is not found. This message indicates that an internal logic error occurred in the TOSI API client connect function.

System action

IMS HP Image Copy abends with U4000 RSN=04.

User response

Contact IBM® Software Support.

FABJ4605E: TOSI NOT ACTIVE ON IMS=*cccc*. IC NOT PERFORMING FOR DBD/PART/AREA=*cccc*

Explanation

The DBD is allocated on an IMS online region on which TOSI server is not active. The DBD cannot be deallocated for a clean copy.

System action

If FALLBACK=Y is specified, IMS HP Image Copy continues to process this DBD. Otherwise, IMS HP Image Copy skips this DBD and starts processing the next DBD.

User response

Ensure that the TOSI server is active on the indicated IMS region.

FABJ4606E: /DBR COMMAND FAILED FOR DBD/PART/AREA=*cccc* ON IMS=*cccc* RC=*nnnn* RSN=*nnnn*.

Explanation

An attempt to run the /DBR command for the DBD or AREA has failed.

System action

Image copy is not performed for this DBD or AREA.

User response

Increase the time limit by specifying the TOITIME keyword and rerun the job. If the database or area is still not stopped, check the IMS console and identify the reason why the database or the area is not stopped. If the problem persists, contact IBM® Software Support and provide the RC and RSN found in the message and dump.

FABJ4607E: /STA COMMAND FAILED FOR DBD/PART/AREA=*cccc* ON IMS=*cccc* RC=*nnnn* RSN=*nnnn*.

Explanation

An attempt to run the /START command for the database or the area failed.

System action

The database or the area remains offline, and IMS HP Image Copy ends with a return code of 4.

User response

Manually issue the /START command for the database or the area. If the problem persists, contact IBM® Software Support and provide the return code and the reason code shown in the message.

FABJ4608E: TOSI DISCONNECT ERROR RC=*nnnn* RSN=*nnnn*. IC PROCESS ABEND U4000 RSN=08

Explanation

An attempt to end the IMS Tools Online System Interface API client environment failed.

System action

The DBDs remain offline, and IMS HP Image Copy ends with ABEND U4000 RSN=08.

User response

Manually issue the /START command for the DBD. Contact IBM® Software Support and provide the dump.

FABJ4609E: TOSI TERM ERROR RC=*nnnn* RSN=*nnnn*. IC PROCESS ABEND U4000 RSN=09

Explanation

An attempt to end the IMS Tools Online System Interface API client environment failed.

System action

The DBDs or AREAs remain offline, and IMS HP Image Copy ends with ABEND U4000 RSN=09.

User response

Manually issue the /START command for the DBDs or AREAs. Contact IBM® Software Support and provide the dump.

FABJ4610E: TOSI API CONNECT ERROR RC=*nnnn* RSN=*nnnn*. IC PROCESS ABEND U4000 RSN=10

Explanation

TOSI CONNECT function failed. This error could be caused by any of the following reasons:

- An invalid TOSI XCF GROUP was specified
- The IMS Tools Online System Interface is not active in the IMS control region
- An internal processing error occurred

System action

IMS HP Image Copy ends with ABEND U4000 RSN=10.

User response

Ensure that the TOSI XCF GROUP is valid. If it is valid, then ensure that the IMS Tools Online System Interface is active in the IMS control region. Otherwise, contact IBM® Software Support and provide the RC and RSN found in the message and dump.

FABJ4611E: TOSI API *function* FAILED TO SEND THE *command* COMMAND TO DBD/PART/AREA=*dddddddd* ON IMS=*iiii*. RC=*rrrrrrrr*, RSN=*ssssssss*. HPIC ERROR REASON CODE IS *xx*.

Explanation

An error occurred in the indicated TOSI API function. The TOSI API function could not send the indicated command to the indicated resource. command is one of the following commands:

- /STA
- /STA GLOBAL
- /DBD GLOBAL NOFEOV
- /DBR GLOBAL NOFEOV
- /DBD
- /DBR
- UPD DB START(QUIESCE)
- UPD DB STOP(QUIESCE)

System action

If the HPIC ERROR REASON CODE is 01, one of the following actions is taken: If FALLBACK=Y is specified and IMS HP Image Copy was able to switch the process to the concurrent image copy process, IMS HP Image Copy continues processing. Otherwise, IMS HP Image Copy issues message FABJ4622E and ends with a return code of 8. In the latter case, no image copies are created for the indicated resource.

If the HPIC ERROR REASON CODE is 02, IMS HP Image Copy ends with a return code of 4.

User response

Because certain IMS commands were not issued, databases, partitions, or areas are not restarted or quiesced. To recover the state of the resources, complete either of the following steps:

- If the HPIC ERROR REASON CODE is 01, locate FABJ4622E messages and follow the User Response of message FABJ4622E.
- If the HPIC ERROR REASON CODE is 02, some resources require the /STA command or the UPDATE STOP(QUIESCE) command. Locate the accompanying FABJ4623E messages, identify the required commands, and issue the commands.

To resolve the problem, locate the IMS Tools Online System Interface error message that corresponds to the indicated TOSI API function.

Table 141: TOSI API functions and error messages

TOSI API *function*	**IMS Tools Online System Interface error message**
REQUEST	FOI532E and FOI533I
RESPONSE	FOI541W

Follow the User Response of the error message in the *IMS Tools Base IMS Tools Common Services User's Guide and Reference* and correct the error. If the problem persists, contact IBM® Software Support.

FABJ4613E: /STA PROCESS FOR DBD/PART/AREA=*cccc* FAILED. DBIM BLOCK NOT FOUND. IC PROCESS ABEND U4000 RSN=13

Explanation

An attempt to /START the DBD or AREA has failed because of an internal logic error.

System action

The DBD or AREA remains offline and IMS HP Image Copy abends with RC=U4000 RSN=13.

User response

Manually issue the /START command for the DBD or AREA. Contact IBM® Software Support and provide the dump.

FABJ4614E: DBD/PART/AREA=*cccccccc* HAS NOT STOPPED WITHIN A TIME LIMIT. IMAGE COPY FOR THIS DBD/PART/AREA IS NOT PROCESSED.

Explanation

An attempt to stop DBD/AREA *cccccccc* did not complete within a time limit set by the TOITIME keyword or the default value.

System action

If FALLBACK=Y is specified, IMS HP Image Copy continues to process this DBD. Otherwise, IMS HP Image Copy skips this DBD or area and starts processing the next DBD or area.

User response

Increase the time limit by specifying the TOITIME keyword and rerun the job. If the database or area is still not stopped, check the IMS console and identify the reason why the database or the area cannot be stopped.

FABJ4615I: TOIAUTO_Q IS NOT SUPPORTED ON THIS SYSTEM ENVIRONMENT. MINVERS IS NOT 11.0 OR HIGHER

Explanation

Your DBRC environment does not satisfy the requirements to issue database quiesce through TOIAUTO_Q=Y. DBRC MINVERS must be 11.0 or higher.

System action

IMS HP Image Copy ignores TOIAUTO_Q=Y and continues processing with TOIAUTO_Q=N.

User response

If you want to enable TOIAUTO_Q=Y, check the DBRC MINVERS information in your environment.

FABJ4616I: [/DBR | /DBD] GLOBAL COMMAND FAILED FOR DBD/PART/AREA=*cccc* ON IMS=*cccc* RC=*nnnn* RSN=*nnnn*.

Explanation

An attempt to run the /DBR or the /DBD command for the database or the area has failed.

System action

IMS HP Image Copy continues processing.

User response

Contact IBM® Software Support and provide the return code and the reason code shown in the message.

FABJ4617E: UPDATE DB START(QUIESCE) COMMAND FAILED FOR DBD/PART/AREA=*dddddddd* [RC=*rc1*, RSN=*rsn1*]

[IMSID=*iiii* CC=*cc* CCTEXT='*text*']

[TOSI RC=*rc2*, RSN=*rsn2*]

Explanation

The database quiesce process that was started by the UPDATE DB START(QUIESCE) or UPDATE AREA START(QUIESCE) command failed. The database or the area is not quiesced. CC shows the completion code from IMS, and CCTEXT explains the meaning of the nonzero completion code. If TOSI return code and reason code are displayed in the message, the message indicates that the error occurred in one of the TOSI API functions.

System action

IMS HP Image Copy does not create image copies for this database or area.

User response

See the topic "UPDATE DB command" or "UPDATE AREA command" in *IMS Commands* and identify the cause of the error from the completion code (CC) and the completion code text (CCTEXT) that are shown in this message. Correct the error and rerun the job.

If TOSI return code and reason code are displayed, contact IBM® Software Support.

FABJ4618E: UPDATE DB STOP(QUIESCE) COMMAND FAILED FOR DBD/PART/AREA=*dddddddd* [RC=*rrrrrrrr*, RSN=*ssssssss*]

[IMSID=*iiii* CC=*cc* CCTEXT='*text*']

[TOSI RC=0000008, RSN=00000001]

Explanation

The database quiesce process that was started by the UPDATE DB STOP(QUIESCE) or UPDATE AREA STOP(QUIESCE) command failed. The database or the area remains quiesced. CC shows the completion code from IMS, and CCTEXT explains the meaning of the nonzero completion code. If TOSI return code and reason code are displayed in the message, the message indicates that the error occurred in one of the TOSI API functions.

System action

IMS HP Image Copy stops processing with a return code of 4.

User response

See the topic "UPDATE DB command" in *IMS Commands* and identify the cause of the error from the completion code (CC) and the completion code text (CCTEXT) that are shown in this message. Correct the error and rerun the job. If the indicated resource is still quiesced, use IMS SPOC or BATCH SPOC to release the quiesce.

If TOSI return code and reason code are displayed, contact IBM® Software Support.

FABJ4619I: [/DBR|/DBD|DB QUIESCE] COMMAND RETRY FOR DBD/PART/AREA=*resource*

Explanation

IMS HP Image Copy reissues the /DBR command, the /DBD command, or the DB QUIESCE command.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ4620I: NO IMS SUBSYSTEM IS AVAILABLE. IMS COMMANDS ARE NOT ISSUED.

Explanation

Because no IMS subsystem is available, IMS HP Image Copy did not issue IMS commands.

System action

IMS HP Image Copy continues processing without issuing IMS commands.

User response

If no active IMS subsystems exist, you can ignore this message. If this message was issued even when one or more active IMS subsystems exist, complete the following steps:

1. Ensure that the correct TOSI XCF group is specified on the TOIXCFGR keyword.
2. Locate message FOI524E (IMS Tools Online System Interface message) and ensure that the IMS subsystem and the TOSI server are active.

FABJ4621E: THE *command* COMMAND FAILED BECAUSE NO IMS SUBSYSTEM IS ACTIVE. HPIC ERROR REASON CODE IS *nn*.

Explanation

If the HPIC ERROR REASON CODE is 01, this message indicates that the indicated IMS command could not be issued because the IMS subsystem was shutting down. The /STA command, the /STA GLOBAL command, or the UPDATE STOP(QUIESCE) command must be issued manually for some databases. Such databases are reported in the accompanying FABJ4623E messages.

System action

IMS HP Image Copy ends with a return code of 4.

User response

Locate FABJ4623E messages and identify the resources and the command required for each resource. Activate the IMS subsystem, and then issue the required command for each resource.

FABJ4622E: IMAGE COPIES OF DBD/PART/AREA=*dddddddd* ARE NOT CREATED.

Explanation

Due to TOSI API function errors or IMS command errors, image copies of the indicated resource are not created.

System action

IMS HP Image Copy continues without creating image copies of the indicated resource.

User response

Locate the preceding error messages, correct the error, and then rerun the job.

FABJ4623E: ISSUE THE *command* COMMAND FOR DBD/PART/AREA=*resource*

Explanation

Issue the indicated command against the indicated resource.

System action

The system action taken is dependent upon the accompanying error message.

User response

When the IMS HP Image Copy job ends, issue the indicated command for the indicated resource.

FABJ4700E: MDA MEMBER *dbname* IS NOT FOUND

Explanation

The MDA member for the indicated database is not found. If the database is a DEDB, the information about the database or the corresponding areas is not defined to DBRC.

System action

IMS HP Image Copy continues processing.

User response

Ensure that the MDA member exists. If the database is a DEDB, ensure that the information about the database and the corresponding areas is defined to DBRC.

FABJ4701E: DDN *ddname* IS NOT DEFINED IN MDA MEMBER *dbname*

Explanation

The indicated DD name (*ddname*), which is for a database data set, is not defined in the indicated MDA member (*dbname*).

System action

IMS HP Image Copy continues processing.

User response

Ensure that the indicated MDA member contains the indicated DD name and rerun the job.

FABJ4702E: DATA SET NAME OF *ddname* DD CANNOT BE OBTAINED BECAUSE DD IS NOT FOUND

Explanation

Failed to obtain the name of the data set that is pointed to by the indicated DD statement (*ddname*).

System action

IMS HP Image Copy continues processing.

User response

Ensure that the indicated *ddname* DD is specified correctly and rerun the job.

FABJ4703E: DATA SET NAME OF *ddname* DD CANNOT BE OBTAINED DUE TO *osmacro*

Explanation

IMS HP Image Copy failed to obtain the name of the data set that is pointed to by the indicated DD statement (*ddname*) because an error was encountered in one of the following OS macros:

- GETDSAB
- SWAREQ

System action

IMS HP Image Copy continues processing.

User response

Contact IBM® Software Support.

FABJ4704E: *ddname* DD IS NOT FOUND IN JCL

Explanation

DBDALLOC=N is specified. However, the required DD statement (*ddname*) is not supplied in the JCL.

System action

IMS HP Image Copy processing ends with a return code of 8.

User response

Add the indicated DD statement to the JCL and rerun the job.

FABJ4705E: NO ADS DD FOR *areaname* AREA IS FOUND IN JCL

Explanation

DBDALLOC=N is specified. However, the DD statement for the indicated area (*areaname*) is not supplied in the JCL.

System action

IMS HP Image Copy processing ends with a return code of 8.

User response

Add the DD statement for the indicated area to the JCL and rerun the job.

FABJ4706E: *ddname* DD IS NOT FOUND IN JCL

Explanation

DSDALLOC=N is specified. However, the indicated DD statement is not supplied in the JCL.

System action

IMS HP Image Copy processing ends with a return code of 8.

User response

Add the indicated DD statement to the JCL and rerun the job.

FABJ9001A: INVALID TIMESTAMP RETURNED FROM EXITNM=*exit_name* HDR TIME(*mm/dd/yyhh:mm*) RETURNED TIME(*mm/dd/yyhh:mm*) REPLY 'Y' FOR CONTINUE PROCESS, OR 'N' FOR STOP WHOLE PROCESS

Explanation

Program DFSURDB0 loaded the compression routine module according to the information recorded in the image copy header record, but the assemble time from the header record did not match the one returned from the compression routine. The compression routine might be modified or reassembled after the creation of the image copy data set.

HDR TIME shows the time stamp from the image copy data set header. RETURNED TIME shows the time stamp from the compression routine interface.

System action

DFSURDB0 issues the WTOR to ask the operator whether to continue the job. This message is reissued until the operator replies with a Y or an N.

User response

Specify a Y to continue the job, or an N to stop.

FABJ9002I: OPERATOR REQUESTED TERMINATION

Explanation

The operator replied with an N to the FABJ9001A message to stop the job.

System action

Program DFSURDB0 stops processing.

User response

None. This message is informational.

FABJ9003E: TIMESTAMP FORMAT ERROR FOUND FROM *exit_name*

Explanation

The user compression routine returned an erroneous format in the assemble time stamp at the initialization call from program DFSUDMP0. Probably, there is an error in the user compression routine.

System action

DFSUDMP0 stops processing.

User response

Correct the error in the user compression routine, and rerun the job.

FABJ9004E: *exit_name* CANNOT BE LOADED

Explanation

Program DFSURDB0 or DFSUDMP0 could not load the user compression routine. Probably the library where the compression routine resides was not specified in the STEPLIB DD statement.

System action

DFSURDB0 or DFSUDMP0 stops processing.

User response

Specify the library in the STEPLIB DD statement correctly. Rerun the job.

FABJ9005E: LENGTH RETURNED FROM USER EXIT ROUTINE NOT MATCH WITH DATABASE RBA OR RBN=X'*xxxxxxxx*'

Explanation

When program DFSURDB0 was run, the user compression routine returned a data length that did not match the LRECL of the database data set. X'*xxxxxxxx*' shows the error location in the database data set by RBA or RBN in hexadecimal value (RBA is for VSAM, and RBN for OSAM). This message indicates a user compression routine error.

System action

DFSURDB0 stops processing with a return code of 16.

User response

Correct the error in the user compression routine, and rerun the job.

FABJ9006E: EXIT ROUTINE *exit_name* CANCELED COMPRESSION ON INITIALIZATION

Explanation

Program DFSUDMP0 made an initialization call to the compression routine, but the compression routine returned the return code 8 to request compression.

System action

DFSUDMP0 deletes the compression routine and continues processing without compression.

User response

None.

FABJ9007I: COMPRESSED BY EXITNM=*exit_name* COMPRESSED COUNT=*nnnnnnnn* COMPRESSED RATIO=*xx.x*%

Explanation

This informational message shows the compression routine name, the number of blocks processed by the compression routine, and the compression ratio.

Compression ratio means how much the image copy data set was compressed, calculated by the following formula:

```
                    The size of compressed ICDS
Compression ratio = ---------------------------
                    The size of original ICDS
```

>100% is shown if no block is compressed.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ9008E: TERMINATION REQUESTED BY *exit_name* [IN | FOR |] *xxxxxxxx* CALL RC=*xx*

Explanation

The user compression routine requested termination of the processing by returning the error return code *xx* (*xx* is in hexadecimal format).

System action

IMS HP Image Copy stops processing with a return code of 16.

User response

If the user compression routine has an error, correct it and rerun the job. For DFSUDMP0, you can choose to process without compression by changing the utility control statement.

FABJ9009E: USER DATA RETURNED FROM EXIT ROUTINE IS TOO LARGE FOR COMPRESSED DATA SET

Explanation

The user compression routine requested to write out the user data into an image copy data set by returning the return code 12, but the length of the user data exceeded the LRECL of the image copy data set. The length of a user data must be less than or equal to the LRECL of the image copy data set.

System action

Program DFSUDMP0 stops processing with a return code of 16.

User response

Check the cause of the error in the user compression routine, correct the error, and rerun the job.

FABJ9010E: DUMP DATA SET IS EMPTY

Explanation

The user compression routine returned the return code of 0 for the termination call from program DFSUDMP0, but it had returned the return code 4 for every block-write call. The dump data set would have the image copy record. This might be a user compression routine error.

System action

DFSUDMP0 stops processing with a return code of 16.

User response

Check the cause of the error in the user compression routine, correct the error, and rerun the job.

FABJ9011I: DB RECORD LENGTH TOO LARGE FOR COMPRESSION. COMPRESSION IS IGNORED

Explanation

The record length of the database data set exceeded the limit of the compression function. The limit is 32,746 bytes.

System action

Program DFSUDMP0 continues processing without the compression function.

User response

None. This message is informational.

FABJ9012E: INVALID LRECL RETURNED FROM *exit_name*

Explanation

The user compression routine returned a zero or a negative value as the record length. This message indicates a user compression routine error.

System action

Program DFSUDMP0 stops processing with a return code of 16.

User response

Check the cause of the error in the user compression routine, correct the error, and rerun the job.

FABJ9013I: *nnnn* RECORDS HAVE BEEN COPIED FOR DBD=*name*, DDNAME=*name* TO ICOUT DDNAME=*name*

Explanation

nnnn (the number of records) have been copied to the indicated DBD name or DDNAME.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ9014I: COPY COMPLETED FOR DBD=*name*, DDNAME=*name*. *nnnn* RECORDS WERE COPIED TO ICOUT DDNAME=*name*

Explanation

Copy of *nnnn* records has been completed for the indicated DBD *name* or DDNAME.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

FABJ9016I: THE IDRC DATA COMPACTION IS ACTIVE

Explanation

The image copy data set on the tape unit is compressed by the Improved Data Recording Capability (IDRC) feature.

System action

IMS HP Image Copy continues processing.

User response

None. This message is informational.

> **Tip:** If you want to use a compression routine of IMS HP Image Copy (FABJCMP1, FABJCMP3, or FABJCMP4), specify COMPMODE=COND for the IMS HP Image Copy job.

FABJ9100W: INVALID DB IS SPECIFIED FOR FABJCMP2. COMPRESSION IS IGNORED

Explanation

An incorrect database is specified for FABJCMP2.

System action

IMS HP Image Copy continues processing with return code 0 and compression is ignored.

User response

If necessary, correct the target database and rerun the job.

Gathering diagnostic information

Before you report a problem with IMS HP Image Copy to IBM® Software Support, you need to gather the appropriate diagnostic information.

Procedure

- Provide the following information for all IMS HP Image Copy problems:
  - A clear description of the problem and the steps that are required to re-create the problem
  - The version of IMS that you are using and the version of the operating system that you are using
  - A complete log of the job
  - A Load Module/Macro APAR Status report

  For information about creating a Load Module/Macro APAR Status report, see "Diagnostics Aid" on page 514.

Diagnostics Aid

If you have a problem that you think is not a user error, run the Diagnostics Aid (FABJDIAG) to generate the Load Module/Macro APAR Status report, attach it to the other diagnostic documents (such as job dump list or I/O of the utility), and report the error to IBM®.

The Diagnostics Aid generates the Load Module APAR Status report and the Macro APAR Status report. These reports show the latest APAR fixes applied to each module and macro.

The Diagnostics Aid is not applicable for any other versions or releases.

Topics:

- "How to run Diagnostics Aid with JCL" on page 514
- "Load Module/Macro APAR Status report" on page 515
- "Messages and codes" on page 516

How to run Diagnostics Aid with JCL

To run the Diagnostics Aid (FABJDIAG), supply an EXEC statement and a DD statement that defines the output data set.

EXEC

This statement must be in the following form:

```
//stepname  EXEC PGM=FABJDIAG
```

STEPLIB DD

This statement defines the library that contains the FABJDIAG program (generally SHPSLMD0).

SHPSLMD DD

This statement defines the library that contains the load modules (generally HPS.SHPSLMD0) for which you have a problem.
The Load Module APAR Status report is not generated if this DD statement is not provided or if DD DUMMY is specified.

It is recommended that you always specify this DD statement.

SHPSMAC DD

This statement defines the library that contains the provided macros (generally HPS.SHPSMAC0) for which you have a problem.
The Macro APAR Status report is not generated if this DD statement is not provided or if DD DUMMY is specified.

SYSPRINT DD

This output data set contains the Load Module/Macro APAR Status report. The data set contains 133-byte, fixed-length records. It can reside on a tape, direct-access device, or printer; or it can be routed through the output stream. If BLKSIZE is coded in the DD statement, it must be a multiple of 133. However, it is recommended that you use:

```
//SYSPRINT  DD SYSOUT=A
```

Load Module/Macro APAR Status report

The Diagnostics Aid generates two reports for the maintenance by IBM®; Load Module APAR Status report and Macro APAR Status report.

Load Module APAR Status report

The Load Module APAR Status report contains information about the modules and their applied APARs.

This report contains the following information:

MODULE LIBRARY

This field includes the data set names specified in the SHPSLMD DD statement. If more than 30 data sets are concatenated, only the first 30 data sets are listed.

MODULE NAME

The name of the load module member or the alias.

ALIAS-OF

The name of the original member of the alias. If the module name is not an alias, this field is left blank.

CSECT NAME

The name of the included CSECT in the module. The CSECT names are reported in the included order in the module.

APAR NUMBER

The latest APAR number applied to the module represented by the CSECT name. If no APAR is applied, NONE is shown.

APAR FIX-DATE

The date when the modification was prepared for the module represented by the CSECT name. If no APAR is applied, N/A is shown.

Notes:

- If the CSECT name does not start with *FAB, HPS,* or the program structure of the CSECT does not conform to the IMS HP Image Copy module standard to identify the APAR number and the APAR fixed date, the fields APAR NUMBER and APAR FIX-DATE are filled with asterisks (*).
- If the load module is a member of the PDSE library, the following statement is shown on the report line and the job completes with a return code of 4.

  ```
  ** IT CAN NOT BE ANALYZED DUE TO PDSE LIBRARY MEMBER **
  ```

- If the load macro fails for a utility member, the following statement is shown on the report line and the job completes with a return code of 8.

  ```
  ** IT CAN NOT BE ANALYZED DUE TO LOAD FAILED MEMBER  **
  ```

Macro APAR Status report

The Macro APAR Status report contains information about macros and their applied APARs.

This report contains the following information:

MACRO LIBRARY

This field includes the data set names specified in the SHPSMAC DD statement. If more than 30 data sets are concatenated, only the first 30 data sets are listed.

MACRO NAME

The name of the macro member or the alias.

ALIAS-OF

The name of the original member of the alias. If the macro name is not an alias, this field is left blank.

APAR NUMBER

The latest APAR number applied to the macro. If no APAR is applied, NONE is shown.

APAR FIX-DATE

The date when the modification was prepared for the macro. If no APAR is applied, N/A is shown.

> **Note:** If the macro source statement structure does not conform to the IMS HP Image Copy macro standard to identify the APAR number and the APAR fixed date, the fields APAR NUMBER and APAR FIX-DATE are filled with asterisks (*).

Messages and codes

The following topics discuss the messages and codes of the Diagnostics Aid.

Return codes

This reference section provides detailed information about the return codes issued by FABJDIAG.

FABJDIAG contains the following return codes:

0

Successful completion of the program.

4

Warning messages were issued, but the requested operation was completed.

8

Error messages were issued, but the request operation was completed.

Abend codes

This reference section provides detailed information about the abend codes issued by FABJDIAG.

All 36*xx* abend codes are accompanied by an FABU36*xx* message. See the appropriate message for problem determination.

Messages

The following topics explain the messages issued by FABJDIAG.

FABU1001I: DIAG ENDED NORMALLY

Explanation

This message is generated when Diagnostic Aid has been completed successfully.

System action

Diagnostic Aid completes the job successfully with a return code of 0.

User response

None. This message is informational.

FABU1002W: DIAG ENDED WITH WARNINGS

Explanation

This message is generated when trivial error conditions are encountered by Diagnostic Aid.

System action

Diagnostic Aid ends with a return code of 4.

User response

See other messages generated by Diagnostic Aid to determine the nature and the cause of the detected errors. Correct the problem and rerun the job.

FABU1003E: DIAG ENDED WITH ERRORS

Explanation

This message is generated when severe error conditions are encountered by Diagnostic Aid.

System action

Diagnostic Aid ends with a return code of 8.

User response

See other messages generated by Diagnostic Aid to determine the nature and the cause of the detected errors. Correct the problem and rerun the job.

FABU1005W: [SHPSLMD | SHPSMAC] DD STATEMENT NOT FOUND

Explanation

Diagnostic Aid could not find the SHPSLMD or the SHPSMAC DD statement.

System action

Diagnostic Aid sets an end-of-job return code of 4 and continues processing. Diagnostic Aid does not generate a report for the load module or the macro.

User response

If you intended to specify the indicated DD statement, correct the error and rerun the job.

FABU1006W: DUPLICATE *member name* IN LIBRARY DDNAME *ddname*

Explanation

Diagnostic Aid found a duplicated member in the concatenated libraries.

System action

Diagnostic Aid uses the member that is first found in the concatenated libraries. Diagnostic Aid sets an end-of-job return code of 4 and continues processing.

User response

Ensure which libraries have correct module/macro libraries. Correct the error and rerun the job if necessary.

FABU1007W: DUMMY SPECIFIED FOR [SHPSLMD | SHPSMAC] DD STATEMENT

Explanation

DUMMY was specified for the SHPSLMD/SHPSMAC DD statement.

System action

Diagnostic Aid sets an end-of-job return code of 4 and continues processing. Diagnostic Aid does not generate a report for the load module or the macro.

User response

If you did not intend to specify the dummy DD statement, correct the error and rerun the job.

FABU1008W: NO [MODULE | MACRO] MEMBERS FOUND IN DDNAME [SHPSLMD | SHPSMAC]

Explanation

Diagnostic Aid could not find any utility modules or macros members from the DD ddname data set.

System action

Diagnostic Aid sets an end-of-job return code of 4 and continues processing.

User response

Ensure that the libraries have correct utility module or macro libraries. Correct the error and rerun the job.

FABU2001E: LOAD FAILED FOR DDNAME *ddname* MODULE *member*

Explanation

Diagnostic Aid could not load a *member name* from *ddname*.

System action

Diagnostic Aid sets an end-of-job return code of 8 and continues processing.

User response

Ensure that the member indicated exists in the data set specified for the indicated *ddname*. Correct the error and rerun the job.

FABU3600E: OPEN FAILED FOR DDNAME *ddname*

Explanation

The named DCB could not be opened.

System action

Diagnostic Aid ends with an abend code of U3600.

User response

Ensure that a *ddname* DD statement exists, and that it specifies the correct DD parameter. Correct any errors and rerun the job.

FABU3601E: GET FAILED FOR DDNAME *ddname*

Explanation

The GET failed for a directory from the DD *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3601.

User response

See the MVS™ system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM® Software Support.

FABU3602E: READ FAILED FOR DDNAME *ddname* MEMBER *member*

Explanation

The READ failed for a *member* from the DD *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3602.

User response

See the MVS™ system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM® Software Support.

FABU3603E: BLDL FAILED FOR DDNAME *ddname* MEMBER *member*

Explanation

The *member* was not found when the BLDL macro searched the PDS directory for the *ddname*.

System action

Diagnostic Aid ends with an abend code of U3603.

User response

Ensure that the member indicated exists in the data set specified for the indicated ddname. Correct the error and rerun the job. If the error persists, contact IBM® Software Support.

FABU3604E: LOAD FAILED FOR DDNAME *ddname* MODULE *member*

Explanation

Diagnostic Aid could not load the *member name* from the *ddname*.

System action

Diagnostic Aid ends with an abend code of U3604.

User response

See the MVS™ system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM® Software Support.

FABU3605E: DELETE FAILED FOR MODULE *member*

Explanation

Diagnostic Aid could not delete a *member name*.

System action

Diagnostic Aid ends with an abend code of U3605.

User response

Contact IBM® Software Support.

FABU3606E: PUT FAILED FOR SYSPRINT

Explanation

Diagnostic Aid could not put report data in SYSPRINT.

System action

Diagnostic Aid ends with an abend code of U3606.

User response

See the MVS™ system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM® Software Support.

FABU3607E: OPEN FAILED FOR SYSPRINT

Explanation

SYSPRINT DCB could not be opened.

System action

Diagnostic Aid ends with an abend code of U3607.

User response

Ensure that a *ddname* SYSPRINT DD statement exists, and that it specifies the correct DD parameter. Correct any errors and rerun the job.

FABU3608E: FIND FAILED FOR DDNAME *ddname* MEMBER *member*

Explanation

The FIND failed for a *member* from DDNAME *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3608.

User response

Ensure that the member indicated exists in the data set specified for the indicated ddname. Correct the error and rerun the job. If the error persists, contact IBM® Software Support.

FABU3609E: DEVTYPE FAILED FOR DDNAME *ddname*

Explanation

The DEVTYPE failed for a DDNAME *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3609.

User response

Contact IBM® Software Support.

FABU3610E: RDJFCB FAILED FOR DDNAME *ddname*

Explanation

The READJFCB failed for a DDNAME *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3610.

User response

Contact IBM® Software Support.

FABU3611E: GETMAIN FAILED. INSUFFICIENT STORAGE TO RUN THE JOB

Explanation

Work space for Diagnostic Aid could not be obtained.

System action

Diagnostic Aid ends with an abend code of U3611.

User response

Increase the region size and rerun the job.

FABU3612E: TOO MANY [MODULE | MACRO] MEMBERS DETECTED IN DDNAME [SFABMOD | SHPSMAC]

Explanation

There are too many utility members in the SFABMOD/SHPSMAC DD data set.

System action

Diagnostic Aid ends with an abend code of U3612.

User response

Specify the correct data set for the indicated DD statement and rerun the job.

Notices

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