

IBM IMS Fast Path Solution Pack for z/OS  
2.1

*Overview and Customization*



**Note:**

Before using this information and the product it supports, read the information in [“Notices” on page 85.](#)

**Eighth Edition (September 2024)**

This edition applies to Version 2.1 of IBM IMS Fast Path Solution Pack for z/OS (program number 5698-FPP) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces GC27-9596-06.

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## About this information

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IBM IMS Fast Path Solution Pack for z/OS® (also referred to as IMS Fast Path Solution Pack) is a product that combines multiple IBM products into a consolidated solution that provides a set of complete and efficient management utilities for IMS Fast Path databases.

IMS Fast Path Solution Pack combines the following products into a single offering:

- IBM IMS Fast Path Solution Pack for z/OS IMS High Performance Fast Path Utilities
- IBM IMS High Performance Image Copy for z/OS
- IBM IMS Library Integrity Utilities for z/OS

IMS Fast Path Solution Pack also includes Database Repair Facility and Database Sensor.

These topics provide an overview of the products and capabilities delivered with IMS Fast Path Solution Pack as well as some common usage scenarios to help you understand the capabilities of the product. It also includes post-SMP/E installation instructions which must be performed before these products can be used.

These topics are designed to help database administrators, system programmers, application programmers, and system operators perform the following tasks:

- Understand the capabilities of the functions associated with IMS Fast Path Solution Pack
- Plan for the installation of IMS Fast Path Solution Pack
- Migrate from previous releases of the tools that comprise IMS Fast Path Solution Pack
- Perform the post-SMP/E installation of IMS Fast Path Solution Pack
- Customize IMS Fast Path Solution Pack

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 Fast Path Solution Pack products and components.

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

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

Always check the IMS Tools Product Documentation page for complete product documentation resources:

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

The IMS Tools Product Documentation page includes:

- Links to [IBM Documentation](#) for the user guides ("HTML")
- Links to the PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Technical notes from IBM Software Support, known as "Tech notes"
- White papers that describe product business scenarios and solutions



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# Chapter 1. IMS Fast Path Solution Pack for z/OS overview

IBM IMS Fast Path Solution Pack for z/OS (also referred to as IMS Fast Path Solution Pack) combines data management tools to provide all the capabilities you need to manage your IMS Fast Path Data Entry Databases (DEDBs).

IMS Fast Path Solution Pack is specifically designed to provide database administrators (DBAs) with smart solutions to database operation and maintenance tasks.

## Topics:

- [“What's new in IMS Fast Path Solution Pack Overview and Customization” on page 1](#)
- [“What is IMS Fast Path Solution Pack?” on page 4](#)
- [“Tools in IMS Fast Path Solution Pack” on page 7](#)
- [“Benefits” on page 10](#)
- [“Installation requirements” on page 11](#)
- [“Service updates and support information” on page 12](#)
- [“Product documentation and updates” on page 13](#)
- [“Accessibility features” on page 14](#)

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## What's new in IMS Fast Path Solution Pack Overview and Customization

This topic summarizes the functional and documentation changes made to *IMS Fast Path Solution Pack: Overview and Customization*.

### New functions and enhancements

This section summarizes some of the major new functions and features that IMS Fast Path Solution Pack 2.1 provides. For a complete list of new function APARs, see [IMS Fast Path Solution Pack 2.1 new functions](#) in IBM Documentation.

#### IMS 15 support

All of the tools in IMS Fast Path Solution Pack support IMS 15.

#### IMS management of ACBs support

Many of the tools in IMS Fast Path Solution Pack support the use of ACBs managed by IMS. If the IMS management of ACBs is enabled, the tools that support this function can read database definitions from the IMS catalog instead of from DBD libraries. For details, see [IBM technote 0731745: IBM IMS Tools and Managed ACB Support](#).

#### Data set encryption support

Many of the tools in IMS Fast Path Solution Pack support data set encryption for IMS data sets. For details, see [IBM technote 0733513: IBM IMS Tools and Data Set Encryption Support](#).

### Documentation changes

This section summarizes documentation changes made to *IMS Fast Path Solution Pack: Overview and Customization*.

New and changed information is indicated by a vertical bar (|) to the left of a change. Editorial changes that have no technical significance are not noted.

Revision markers follow these general conventions:

- Only technical changes are marked; style and grammatical changes are not marked.
- If part of an element, such as a paragraph, syntax diagram, list item, task step, or figure is changed, the entire element is marked with revision markers, even though only part of the element might have changed.
- If a topic is changed by more than 50%, the entire topic is marked with revision markers (so it might seem to be a new topic, even though it is not).

Revision markers do not necessarily indicate all the changes made to the information because deleted text and graphics cannot be marked with revision markers.

### GC27-9596-07 (September 2024)

Description	Related APARs
<p>Online Structure Change utility: The Online Structure Change utility (OSC) supports the Integrity Checker utility of IMS Library Integrity Utilities. If the Integrity Checker utility is activated, the integrity of new database definitions (ACBs, randomizers, and segment edit/compression routines) specified for the OSC driver job are checked against the database definitions used in the DBCTL environment.</p> <p>The following topic is updated: <a href="#">“Configuring the IMS DBCTL system”</a> on page 49.</p>	PH61674

### GC27-9596-06 (May 2024)

Description	Related APARs
Removed information related to IMS Tools Base for z/OS 1.6.	N/A

### GC27-9596-05 (October 2023)

Description	Related APARs
Removed information related to IBM Management Console for IMS and Db2® for z/OS.	N/A

### GC27-9596-04 (December 2022)

Description	Related APARs
<p>Online Structure Change utility: The Online Structure Change utility (OSC) supports IMS Tools Common Pauser to enable the BMP, CICS, and ODBA application pause features. The following topics are added or updated:</p> <ul style="list-style-type: none"> <li>• <a href="#">“Installation requirements”</a> on page 11</li> <li>• <a href="#">“Gathering the data set names of IMS Fast Path Solution Pack and IMS Tools Base”</a> on page 26</li> <li>• <a href="#">“Configuring IMS Tools Base ”</a> on page 33</li> <li>• <a href="#">“APF authorizing the program libraries”</a> on page 36</li> <li>• <a href="#">“Configuring the OSC logger exit routine by using IMS Tools Generic Exits”</a> on page 47</li> <li>• <a href="#">“Configuring the OSC logger exit routine by using the IMS refreshable logger exit routine”</a> on page 48</li> <li>• <a href="#">“Configuring IMS Tools Common Pauser”</a> on page 52</li> </ul>	PH48696



## GC27-9596-03 (July 2022)

Description	Related APARs
Documentation updates to support IBM IMS Tools Base for z/OS 1.7 and IMS Administration Foundation. IMS Administration Foundation activates the IMS administration web-browser interface of IBM Unified Management Server for z/OS to enable the management of IMS systems and resources.	N/A

## GC27-9596-02 (January 2022)

Description	Related APARs
<p>If the OSC logger exit routine is configured by using the IMS refreshable logger exit routine, the Online Structure Change utility can be executed while the logger exit routines for other OEM products are running in the same IMS environment. The following topics are updated:</p> <ul style="list-style-type: none"><li>• <a href="#">“Configuring the OSC logger exit routine by using IMS Tools Generic Exits” on page 47</a></li><li>• <a href="#">“Configuring the OSC logger exit routine by using the IMS refreshable logger exit routine” on page 48</a></li></ul>	PH40905

## GC27-9596-01 (November 2020)

Description	Related APARs
<p>If the OSC logger exit routine is configured, the Online Structure Change utility can be executed while the following IBM product jobs are running in the same IMS environment:</p> <ul style="list-style-type: none"><li>• IBM Security Guardium® S-TAP® for IMS on z/OS</li><li>• IMS Online Reorganization Facility of IBM IMS Database Solution Pack for z/OS</li></ul> <p>For information about configuring the OSC logger exit routine, see <a href="#">“Configuring the OSC logger exit routine” on page 47</a>.</p>	PH27204
<p>The "Conditional operational requirements" section in <a href="#">“Installation requirements” on page 11</a> has been updated.</p>	PH26632

## GC27-9596-00 (March 2020)

Description	Related APARs
<p>Online Structure Change utility: The Online Structure Change utility helps you restructure online DEDB or areas with minimal impact to database availability. The utility supports changing DBD descriptions, randomizing modules, and segment edit/compression routines.</p> <p>The online restructuring capability provides users with full access to the database during database restructure, improves the overall database availability, and reduces planned downtime.</p> <p>The utility allocates shadow area data sets to perform unload and reload while capturing all database updates made by applications. When unload and reload is done, it uses an IMS DBCTL system to apply all the captured updates and switches the original area data sets with new restructured area data sets. A single /DBR command outage is necessary to switch the area data sets.</p> <p>To use the Online Structure Change utility, IMS 15 is required. This utility cannot be used with IMS 14.</p> <p>To learn more about the Online Structure Change utility, see the <i>IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide</i>.</p>	N/A

## What is IMS Fast Path Solution Pack?

IMS is IBM's premier transaction and hierarchical database management system. It is the product-of-choice for critical online operational applications and data in which support for high availability, performance, capacity, integrity, and low cost are key requirements. IMS manages the world's most mission-critical data and is integral to today's resurgence of mainframe usage.

The total cost of ownership (TCO) of any database management system (DBMS) is comprised of more than software and hardware costs. To determine the total cost, you must factor in scalability, reliability, systems management, the cost of database professionals to program, support, and administer the DBMS, and the cost of the computing resources that are required to operate the DBMS.

IBM IMS Tools further lower IMS's TCO by enabling personnel who have less IMS and mainframe experience to perform common tasks, while freeing more experienced personnel to focus on complex or strategic tasks. All these benefits can be realized by implementing IBM's IMS Fast Path Solution Pack.

IMS Fast Path Solution Pack provides an effective and efficient approach for managing your data entry databases (DEDBs) quickly and accurately. IMS Fast Path Solution Pack can contribute to reducing the overall total cost of ownership of IMS and, in turn, improve the return on investment (ROI).

IMS Fast Path Solution Pack provides the following solutions to simplify management of DEDBs:

- A database monitoring solution that helps to keep databases in optimal condition by automating database monitoring tasks.
- A database reorganization solution that supports the following reorganization capabilities:
  - The online reorganization capability manages space of online areas with no downtime.
  - The offline reorganization capability reorganizes areas faster with a short maintenance batch window.
  - The integrated reorganization capability automates reorganizations and extensions of online areas.
  - The online database restructuring capability restructures online areas with minimal impact to database availability.
- A database tuning solution that helps DBAs analyze IMS databases and determine the most effective database organization and definition.

Subsections:

- [“Database monitoring solution” on page 5](#)

- [“Database reorganization solution” on page 5](#)
- [“Database tuning solution” on page 6](#)

## **Database monitoring solution**

Highly skilled IT resources are vital for keeping databases in optimal condition. Competitive businesses cannot afford for their best people to be tied up with repetitive database maintenance tasks.

The database monitoring solution of IMS Fast Path Solution Pack is the key to database administration that not only lightens DBAs' work load but also keeps databases safe. The database monitoring solution helps your DBAs better manage your databases.

### **Automating database monitoring**

DBAs assess database conditions by analyzing various reports that are generated by the tools or programs used in their workshops.

With IMS Fast Path Solution Pack's database monitoring solution, database statistics are collected automatically during DBA's daily or weekly operations, and are accumulated in a repository. The accumulated statistics are automatically evaluated from various perspectives, and DBAs are alerted if DEDB areas are in exceptional conditions. Because only the DEDB areas that need a DBA's attention are alerted, even if your DBAs manage hundreds or thousands of DEDB areas, DBAs can easily identify the DEDB areas that require attention.

### **Viewing database conditions graphically**

Database trends are an important factor in making database maintenance and migration plans for optimal database performance. However, DBAs require time, skill, knowledge, and experience to track the trends of databases, assess database statistics, and maintain historical data.

With IMS Fast Path Solution Pack's database monitoring solution, DBAs can use web browsers to view interactive charts that show historical data and database trends. Through this graphical web interface, DBAs can also view the structure and the source code of the databases.

This graphical web interface helps DBAs acknowledge the database conditions at a glance. Less experienced DBAs can also use the interface to learn the structure and relationships between databases.

The database monitoring solution relieves the day-to-day burden of collecting, analyzing, and managing statistics by automating the monitoring of database health.

## **Database reorganization solution**

Keeping IMS databases reorganized helps ensure that your IMS applications perform at their optimal levels. IMS Fast Path Solution Pack can help reduce the time that is required to keep databases in top condition, while enhancing DBAs' ability to manage IMS databases.

The database reorganization solution reduces the amount of time databases are unavailable by supporting an efficient reorganization process, and helps your DBAs reorganize databases quickly without affecting IMS transactions and applications.

The database reorganization solution covers all the necessary reorganization procedures (unload, reload, initialize, build and synchronize secondary indexes, pointer check, and image copy), improves DBA productivity through a single-step reorganization process, and eliminates the need for operator intervention after a reorganization finishes.

IMS Fast Path Solution Pack supports the following capabilities for database reorganization.

### **Online reorganization without downtime**

Many businesses are moving toward 24x7 operations; to do so, key databases must be available around the clock. Taking systems offline for maintenance can affect your business. In today's market, systems must be highly available because the cost of outages can be high.

The online reorganization capability provides two methods for managing the space of online areas: reorganize the free space of DEDBs and extend the space of DEDBs. Both methods provide users

with full access to the database during data reorganization, improve overall database availability, and prevent planned downtime. DBAs can schedule when to reorganize online databases by predefining an online reorganization window, which saves DBA resources, and increases database availability.

### **Integrated reorganization capability for automation**

The integrated reorganization capability provides an integrated database reorganization infrastructure for DEDBs. It analyzes databases, evaluates database statuses against policies, and, when necessary, reorganizes or extends areas automatically.

With this capability, DBAs can:

- Achieve fast database reorganization and extension without manual intervention.
- Detect database problems before they negatively affect business.
- Customize and define policies to ensure that each database continues to satisfy its business requirements.
- Easily access all the resources they need from central repositories.

The integrated reorganization capability provides an end-to-end database reorganization solution for DBAs.

### **Offline reorganization with high performance methods**

The offline reorganization capability provides an integrated database reorganization infrastructure for DEDBs.

When DBAs detect a space shortage problem in a database, they must maintain the database before the database negatively affects business. Maintenance tasks include determining the database definitions or changing the randomizer, unloading the data, and then reloading the data to apply the change.

By applying the integrated database reorganization infrastructure and the high performance I/O technique of IMS Fast Path Solution Pack, the CPU time and elapsed time that is required for these tasks is reduced. DBAs can use simple JCL statements that follow simple format. Therefore, DBAs can simplify database maintenance tasks and efficiently perform such tasks with little database downtime.

### **Online database restructuring capability**

As the amount of data in a DEDB grows, DBAs might consider how they can change the structure of the DEDB to better maintain the DEDB. IMS Fast Path Solution Pack provides the capability to change the structure of online database. This capability helps DBAs restructure online DEDB or areas with minimal impact to database availability. By using this utility, DBAs can change DBD descriptions, randomizing modules, and segment edit/compression routines while the DEDB is online.

## **Database tuning solution**

The mainframe computer handles mission-critical tasks. As a result, DEDBs keep expanding day by day. As database records and segments in an area increase, the space utilization of the area becomes inefficient to the point that tuning is required. A poorly tuned DEDB area might require excessive physical I/Os to read root segments and database records.

Tuning a database often involves significant and time-consuming database administration tasks such as tuning the randomizer, increasing the amount of free space, changing the database structure, or adding areas.

The tuning utility provided in IMS Fast Path Solution Pack facilitates multiple iterations of the database tuning process, which allows your DBAs to select physical database attributes that meet the performance and space utilization requirements, and keep your business running at optimal efficiency.

The database tuning solution helps to keep your databases optimized for the best performance and enables your DBAs to reorganize databases efficiently by allowing them to do complex tasks with small work load.

## Tools in IMS Fast Path Solution Pack

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IMS Fast Path Solution Pack combines IMS Tools products into a single solution to provide an effective and efficient approach for managing your data entry databases (DEDBs) quickly and accurately.

The following tools and functions are included in IMS Fast Path Solution Pack:

- IMS High Performance Fast Path Utilities
  - IMS Fast Path Advanced Tool
  - IMS Fast Path Online Tools
  - IMS Fast Path Basic Tools
  - Online Space Management utility
  - Online Structure Change utility
  - Supplementary utilities
- Database Sensor

The following tools and functions are included in the IMS Fast Path Solution Pack but are shipped in separate target and distribution libraries:

- IBM IMS High Performance Image Copy for z/OS
- IBM IMS Library Integrity Utilities for z/OS
- Database Repair Facility

Subsections:

- [“IMS Fast Path Advanced Tool” on page 7](#)
- [“IMS Fast Path Online Tools” on page 7](#)
- [“IMS Fast Path Basic Tools” on page 8](#)
- [“Online Space Management utility” on page 8](#)
- [“Online Structure Change utility” on page 8](#)
- [“Supplementary utilities” on page 8](#)
- [“IBM IMS High Performance Image Copy for z/OS” on page 8](#)
- [“IBM IMS Library Integrity Utilities for z/OS” on page 9](#)
- [“Database Sensor” on page 9](#)
- [“Database Repair Facility” on page 9](#)

### IMS Fast Path Advanced Tool

IMS Fast Path Advanced Tool (also referred to as FPA), which is one of the IMS High Performance Fast Path Utilities, provides various key functions for managing offline DEDBs and Fast Path secondary index databases in just one step. The functions provided are Unload, Reload, Change, Reorg, Analyze, Tune, Extract, DMAC Print, Build Index, Resync, Freespace Reclaim, and Initialize.

You can run these functions by using simple JCL statements that follow an easy-to-understand format. You can omit certain DD statements from the JCL statements. When these DD statements are omitted, the tool dynamically allocates required data sets. The tool enables you to use the same JCL statements for various functions by simply changing the control statements.

To learn more about IMS Fast Path Advanced Tool, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

### IMS Fast Path Online Tools

IMS Fast Path Online Tools (also referred to as FPO), which is one of the IMS High Performance Fast Path Utilities, helps you to boost system availability by performing various key functions without having to take

your IMS database offline. The functions provided are DEDB Online Pointer Checker, DEDB Online Data Extract, DEDB Online Area Extender, DEDB Online Expert Reorganization, and DEDB Online DMAC Print.

To learn more about IMS Fast Path Online Tools, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

## **IMS Fast Path Basic Tools**

IMS Fast Path Basic Tools (also referred to as FPB), which is one of the IMS High Performance Fast Path Utilities, helps you analyze, maintain, tune, and migrate offline DEDBs. The functions provided are DEDB Pointer Checker, DEDB Tuning Aid, DEDB Unload, and DEDB Reload.

To learn more about IMS Fast Path Basic Tools, see the *IMS Fast Path Solution Pack IMS Fast Path Basic Tools User's Guide*.

## **Online Space Management utility**

The Online Space Management utility (also referred to as OSM), which is one of the IMS High Performance Fast Path Utilities, simplifies reorganization and extension of online DEDB areas by integrating and automating database space management tasks.

When the Online Space Management utility is used with active autonomies features of IMS Tools Base Autonomics Director, Autonomics Director periodically collects and evaluates sensor data, makes recommendations, and starts Online Space Management utility jobs to perform the recommended actions.

To learn more about the Online Space Management utility, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

## **Online Structure Change utility**

The Online Structure Change utility (also referred to as OSC), which is one of the IMS High Performance Fast Path Utilities, helps you restructure online DEDB or areas with minimal impact to database availability. The utility supports changing DBD descriptions, randomizing modules, and segment edit/compression routines.

The online restructuring capability provides users with full access to the database during database restructure, improves the overall database availability, and reduces planned downtime.

To use the Online Structure Change utility, IMS 15 is required. This utility cannot be used with IMS 14.

To learn more about the Online Structure Change utility, see the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

## **Supplementary utilities**

Supplementary utilities of IMS High Performance Fast Path Utilities provide many functions to help you manage IMS Fast Path databases more efficiently. For example, capability to run Hash Check against the DEDB while IMS High Performance Image Copy creates copies of the DEDB, a reporting tool that reports trends in SDEP space utilization, and more.

To learn more about the supplementary utilities, see the *IMS Fast Path Solution Pack Supplementary Utilities User's Guide*.

## **IBM IMS High Performance Image Copy for z/OS**

IBM IMS High Performance Image Copy for z/OS (also referred to as IMS HP Image Copy) enables you to quickly back up and recover database data sets by providing support for advanced copying features.

Using image copies to create backup data is essential to the timely recovery of databases after a loss of data or a programming error. However, taking data offline can reduce user productivity and negatively impact your business. IMS HP Image Copy provides rapid image copy features that reduce the amount

of time that DEDB areas are unavailable. These features enable automated operation that takes the database offline before taking a batch image copy and restarts it after the process. IMS HP Image Copy helps you speed recovery time by supporting quick copy and restarting methods, and allows your users to become more productive and avoid expensive losses from missed business opportunities.

To learn more about IMS HP Image Copy, see the *IMS High Performance Image Copy User's Guide*.

## **IBM IMS Library Integrity Utilities for z/OS**

IBM IMS Library Integrity Utilities for z/OS (also referred to as IMS Library Integrity Utilities) provides a set of utilities designed to validate, compare, map, recover, report, and regenerate a number of IMS libraries needed for operations.

Supported libraries include the ACB (application control block), DBD (database description), PSB (program specification block), MFS (Message Format Services) libraries, libraries containing DFSMDA members, IMS catalog, IMS directory, and RECON (recovery control) data sets. The utilities are used in conjunction with database maintenance tasks and migration operations, and to prevent accidental misuse in production.

To learn more about IMS Library Integrity Utilities, see the *IMS Library Integrity Utilities User's Guide*.

IMS Library Integrity Utilities also provides the DBD/PSB Map Viewer, which is an IMS Library Integrity Utilities extension for IMS Administration Foundation. This extension enables the DBD and PSB Map feature for IMS Administration Foundation. The DBD and PSB Map feature displays graphical visualization of database segment tree structures, program specifications, and DBD and PSB macro source statements. You can also use the cross reference feature to list logical DBDs and PSBs that refer to a specific DBD.

## **Database Sensor**

Database Sensor collects statistics about DEDBs and stores them as *sensor data* in the Sensor Data repository of IMS Tools Knowledge Base. Sensor data can be used for monitoring and maintaining the health, performance, and recoverability of the database.

You can use IMS Administration Foundation to view graphical visualization and charting of sensor data, exceptions that are detected by the policy evaluations, and recommendations for resolving database exceptions.

Database Sensor can be run as a stand-alone job, or can be called within the following utility jobs:

- IMS Fast Path Advanced Tool
- IMS Fast Path Online Tools
- Online Space Management utility
- IMS High Performance Image Copy

To learn more about Database Sensor, see the *IMS Solution Packs Data Sensor User's Guide*.

## **Database Repair Facility**

Database Repair Facility is a powerful tool to repair VSAM and OSAM organized IMS databases that contain pointer or data errors. It can be run both interactively for VSAM and OSAM data sets or in batch mode for VSAM only data sets that are either IMS and non IMS data sets. The interactive capabilities of Database Repair Facility let you make the repair in a short time, which means that the affected database need be taken offline only for a brief period. In this way, Database Repair Facility enhances not only the integrity but also the availability of IMS databases.

To learn more about Database Repair Facility, see the *IMS Database Repair Facility for IMS Solution Packs User's Guide*.

## Benefits

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IMS Fast Path Solution Pack helps you simplify and accelerate the database maintenance tasks for IMS Fast Path Data Entry Databases (DEDBs).

IMS Fast Path Solution Pack provides a complete set of tools that help IMS DBAs in every phase of database management. The tools are high performance, easy-to-use, and powerful, and include capabilities for database reorganization, data backup, health check, verification, tuning, monitoring, and optimization of DEDBs.

Extensive utilities of IMS Fast Path Solution Pack include all the functions your database administrator needs to analyze, maintain, and tune IMS DEDBs, as well as the functions to build, synchronize, and analyze Fast Path secondary index (FPSI) databases. It also provides features that can help boost system availability by enabling the operation of a variety of key functions without taking your IMS databases offline.

IMS Fast Path Solution Pack provides the following benefits:

- IMS HP Fast Path Utilities can save time and money by reducing the CPU and elapsed time required for multiple DEDB areas reorganization tasks into a single job step for parallel operation.
- IMS HP Fast Path Utilities further reduce time and resource requirements by enabling initialize, unload, reload, analyze, and backup tasks to run, and by eliminating I/Os for intermediate data sets. It also enhances the productivity of database administrators by making the reorganization processes simpler and easier, and by minimizing manual interventions.
- IMS HP Fast Path Utilities provides capabilities to build Fast Path secondary indexes and synchronize Fast Path secondary indexes with their DEDB database when they are out of synchronization. These capabilities help simplify the management of Fast Path secondary indexes.
- IMS HP Fast Path Utilities facilitates multiple iterations of the database tuning process, which allows you to select physical database attributes that meet your performance and space utilization requirements. This enables you to keep your database performing optimally and migrate your database quickly with small work load.
- The Online Expert Reorganization utility that is provided by IMS Fast Path Online Tools of IMS HP Fast Path Utilities saves online system resource and eliminates unnecessary reorganizations by identifying only those databases that need to be reorganized based on user-defined thresholds.
- The online and offline Pointer Checker utilities that are provided by IMS HP Fast Path Utilities ensure that your database pointers are error free. They help you detect and correct database errors quickly and repair them with minimum downtime to your IMS environment with Database Repair Facility.
- The Online Space Management utility saves online system resources by evaluating the database with user-specified criteria, and running the reorganization and area extension job only when such an operation is effective for the database.
- The Online Structure Change utility allows to change the structure of a DEDB while keeping the database available to applications.
- The supplementary utilities that are provided by IMS HP Fast Path Utilities help user applications easily maintain the DEDB areas.
- IMS HP Image Copy reduces the unavailability time of databases by providing rapid image copy features, parallel processing, and minimized manual interventions. It also reduces operational and media costs by compressing and stacking the image copies.
- IMS Library Integrity Utilities enhances the productivity of DBAs by providing utilities that effectively manage IMS ACB, DBD, PSB, MFS libraries, libraries containing DFSMDA members, IMS catalog, IMS directory, and RECON data sets in database maintenance tasks and migration operations. It also avoids application downtime by preventing database corruption that might occur from accidental misuse of IMS libraries in production.
- Provides a graphical view of IMS databases and program specifications through IMS Administration Foundation. Database segment tree structures, program specifications, and source code can be reviewed to simplify database administration tasks. The graphical interface can be used as an educational tool for new DBAs to learn about databases.



- With the automated sensor data collection and exception detection that are provided by Autonomics Director and IMS Fast Path Solution Pack, you can save time and resources in monitoring and tuning IMS DEDBs.
- With the graphical web interface that is provided by IMS Administration Foundation, you can analyze your IMS environment to rapidly identify database exceptions and tuning opportunities.

## Installation requirements

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The tools that are provided in IMS Fast Path Solution Pack have dependencies on IMS and require the tools provided in IBM IMS Tools Base for z/OS (also referred to as IMS Tools Base).

### Installation requirements

IMS Fast Path Solution Pack requires z/OS 2.4 (5650-ZOS) or later.

In addition, IMS Fast Path Solution Pack requires IBM IMS Tools Base for z/OS 1.7 (5655-V93) or later. IBM IMS Tools Base for z/OS must be installed into the same SMP/E CSI zone as IMS High Performance Image Copy of IMS Fast Path Solution Pack.

### Operational requirements

An operational requisite is defined as a product that is required and must be present or a product that is not required but should be present on the system in order for this product to operate all or some of its functions.

IMS Fast Path Solution Pack requires one of the following IMS versions:

- IMS 15.2 (5635-A06) or later
- IMS Database Value Unit Edition 15.2 (5655-DS5) or later

### Common tool requirements

The following common tools, which are provided in IMS Tools Base, are used by IMS Fast Path Solution Pack:

- Autonomics Director
- Distributed Access Infrastructure
- IMS Tools Common Services

This tool is a prerequisite for running IMS Tools functions in IMS-managed ACBs environment.

- IMS Tools Knowledge Base
- Policy Services

These common tools are not distributed with IMS Fast Path Solution Pack but are instead distributed with IMS Tools Base. IMS Tools Base must be installed and configured before IMS Fast Path Solution Pack can be used.

IMS Tools Base also provides IMS Administration Foundation, which is a browser-based graphical user interface that extends the capabilities of IBM Unified Management Server for z/OS to manage IMS systems and resources. To enable the graphical user interface of IMS Administration Foundation, the following products must be installed:

- IBM Unified Management Server for z/OS 1.1 with APAR PH47708 or later, and its prerequisite software
- IBM IMS Tools Base for z/OS 1.7 or later

### Conditional operational requirements

A conditional operational requisite identifies the following products that are not required for the basic function but are needed at run time for the tool to utilize specific functions.

Table 1. Conditional operational requirements

Tool	Function	Required product
Database Repair Facility	Process through TSO terminals	The Interactive System Productivity Facility (ISPF), which is included in z/OS
IMS HP Fast Path Utilities	<ul style="list-style-type: none"> <li>• Pointer Check functions</li> <li>• Restructure functions</li> <li>• Reorganization functions</li> <li>• Build Index function</li> <li>• Resync function</li> <li>• Online Space Management utility</li> <li>• Online Structure Change utility</li> </ul>	The DFSORT program, which is included in z/OS, or a functionally equivalent sort program
	Enable image copy functions	IMS HP Image Copy
	Online Structure Change utility	<ul style="list-style-type: none"> <li>• IMS 15 with APARs PH00728, PH09142, PH16612, and PI83433.</li> </ul> <p>The Online Structure Change utility cannot be used with IMS 14.</p> <ul style="list-style-type: none"> <li>• IMS Tools Base 1.6 (with APARs PH21599 and PH28397) or later.</li> <li>• IMS Tools Base 1.7 (with PH48392) or later to enable the BMP, CICS, and ODBA application pause features.</li> </ul>
IMS HP Image Copy	DEDB Hash Pointer Check function	IMS Fast Path Solution Pack
IMS Library Integrity Utilities	<ul style="list-style-type: none"> <li>• ACBLIB Analyzer utility</li> <li>• Integrity Checker utility</li> </ul>	The DFSORT program, which is included in z/OS, or a functionally equivalent sort program
	DBD and PSB Map feature	IMS Administration Foundation of Unified Management Server

**Note:** To run the Online Structure Change utility in an IMS environment where IBM Security Guardium S-TAP for IMS on z/OS is running, the following APARs must be applied:

- APAR PH27204 to IBM IMS Fast Path Solution Pack for z/OS
- APAR PH27744 to IBM Security Guardium S-TAP for IMS on z/OS

## Service updates and support information

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

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

[IBM Support: IMS Fast Path Solution Pack for z/OS](#)

## Product documentation and updates

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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 notes from IBM Software Support, referred to as "Tech notes"
- 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>

### Product publications

For detailed information about tools and components of IMS Fast Path Solution Pack and related products, refer to the publication libraries of the individual products.

#### **IMS Fast Path Solution Pack for z/OS 2.1 IMS High Performance Fast Path Utilities**

*User's Guide, SC27-9536*

#### **IMS Fast Path Solution Pack for z/OS 2.1 IMS Fast Path Basic Tools**

*User's Guide, SC27-9597*

#### **IMS Fast Path Solution Pack for z/OS 2.1 Supplementary Utilities**

*User's Guide, SC27-9598*

#### **IMS High Performance Image Copy for z/OS 4.2**

*User's Guide, SC19-2756*

#### **IMS Library Integrity Utilities for z/OS 2.2**

*User's Guide, SC19-3979*

#### **IMS Solution Packs Data Sensor**

*User's Guide, SC19-3283*

#### **IMS Database Repair Facility for IMS Solution Packs**

*User's Guide, SC19-2916*

All the information about these tools and common tools (IMS Tools Base and IMS Administration Foundation) can be found in [IBM Documentation](#).

### Receiving documentation updates automatically

To automatically receive automated emails that notify you when new technote documents 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.

To register with the My Notifications service:

1. Go to <https://www.ibm.com/support/mynotifications>
2. Enter your IBM ID and password, or create one by clicking **register now**.
3. When the My Notifications page is displayed, click **Subscribe** to select those products that you want to receive information updates about. The IMS Tools option is located under **Software > Information Management**.
4. Click **Continue** to specify the types of updates that you want to receive.
5. Click **Submit** to save your profile.

## Prerequisite knowledge

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 Fast Path Solution Pack products and components.

## 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 or any other IMS Tools 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.

## Accessibility features

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

The major accessibility features in IMS Fast Path Solution Pack enable users to perform the following activities:

- Use assistive technologies such as screen readers and screen magnifier software. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.
- Customize display attributes such as color, contrast, and font size.
- Operate specific or equivalent features by using only the keyboard. 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.

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## Chapter 2. Scenarios: Managing IMS Fast Path databases

Typical scenarios demonstrate how IMS Fast Path Solution Pack can help you manage your IMS Fast Path environment.

### Topics:

- [“Monitor database space utilization” on page 15](#)
- [“Prevent application performance degradation and attain better free space usage” on page 16](#)
- [“Verify the integrity of all IMS pointer values and analyze the space utilization of the database” on page 17](#)
- [“Backup databases” on page 18](#)
- [“Manage IMS ACB/DBD/PSB/MFS libraries, RECON data sets, and IMS catalog” on page 18](#)
- [“Store tool reports in a central repository for better search” on page 19](#)
- [“Automate sensory data collection and exception detection” on page 19](#)
- [“Aggregate information about database resources on a graphical user interface” on page 19](#)

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### Monitor database space utilization

IMS Fast Path Solution Pack, along with IMS Tools Base components, provides space monitoring solutions.

IBM IMS Tools Base for z/OS IMS Tools Knowledge Base provides an infrastructure for common information repositories for IMS system management. It provides centralized management of various types of repositories.

The reports that are generated by the IMS Fast Path Solution Pack products can be stored in a repository. You can search historical copies of those reports by database name, date and time, or other search criteria.

You can also define and store in the repository the threshold criteria for detecting database exceptions and generating recommendations. IBM IMS Tools Base for z/OS Policy Services and IBM IMS Tools Base for z/OS Autonomics Director use these resources to provide the conditional reorganization and conditional area extension capabilities. The data is evaluated against the threshold criteria to decide whether to reorganize the area, extend the area, or both.

Several utilities and functions of IMS Fast Path Solution Pack take advantage of the Sensor Data repository:

- Analyze function of FPA
- Online pointer check function of FPO
- IMS High Performance Image Copy
- Online Space Management utility

You can generate sensor data as a by-product of running your normal FPA, FPO, and IMS HP Image Copy jobs. The Online Space Management utility, which performs online reorganization and online area extension, can also collect and store the sensor data of the area after the area is reorganized or extended by the utility. This functionality is called the Integrated Database Sensor function.

Additionally, IMS Fast Path Solution Pack includes Stand-alone Database Sensor, whose sole function is to collect and print sensor data. These components, when used together with IBM IMS Tools Base for z/OS Autonomics Director and IMS Administration Foundation features of IBM Unified Management Server for z/OS, provide a comprehensive database space monitoring environment.

For more information, see the following publications:

- *IMS Solution Packs Data Sensor User's Guide*
- *IMS Tools Base Autonomics Director User's Guide and Reference*
- *IMS Tools Base IMS Tools Knowledge Base User's Guide and Reference*
- *IMS Tools Base Policy Services User's Guide and Reference*
- *Unified Management Server User Guide*
- *IMS Solution Packs IMS Database Space Tuning Guide*

## Prevent application performance degradation and attain better free space usage

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As records in a DEDB area are added, updated, and deleted, free space can be fragmented or segments in a database record can be stored across a large number of separate CIs. Fragmentation of free space and scattered segments can cause the performance of applications to suffer. When available space is used up, new segments cannot be added.

Reorganizing fragmented free space of an area can prevent performance degradation by using free space more efficiently.

Tuning a DEDB area often involves significant and time-consuming database administration tasks including increasing the amount of free space, changing the database structure, or adding and deleting areas. These tasks often require the database or areas to be taken offline, which might not be an acceptable option for some organizations.

IMS Fast Path Solution Pack provides various offline and online reorganization solutions to simplify these reorganization and tuning tasks. You can choose the solution that best meets the needs of your operation environment.

### Offline solutions

IMS Fast Path Solution Pack provides a complete set of high-performance utilities to unload, reload, and reorganize DEDB areas of offline IMS Fast Path databases.

IMS Fast Path Advanced Tool provides the following batch offline reorganization solutions:

- IMS Fast Path Advanced Tool combines the Unload function and the Reload function to provide a high-speed method for reorganizing offline Fast Path databases. The integration of the Unload and the Reload functions processes DEDB areas faster than when the segments are read and inserted by using IMS online applications. This method creates an intermediate file (a sequential file that contains unloaded segment records) that can be used to obtain specific database statistics for data analysis or that can be used to create DEDB areas for testing purposes.
- The Change function is also a high-speed reorganization function. This function does not create an intermediate file; however, because the segments in DEDB areas are unloaded and reloaded in a single job step, the Change function works faster than using the Unload and the Reload functions together.
- The Reorg function evaluates units of work (UOWs), which are the smallest unit for reorganization process in DEDB areas, ranks the UOWs, and reorganizes the sets of UOWs based on the ranked set of UOWs. All these processes are done in a single job step. The Reorg function requires less space than other reorganization functions.
- The Initialize function is a high-speed initialization function. This function initializes multiple DEDB areas efficiently by processing multiple DEDB areas concurrently in a single job step.

### Online solutions

The ability to reorganize online DEDB areas is crucial in certain operating environments. For database administrators who must keep their IMS environments online 24 hours a day, 7 days a week, IMS Fast Path Solution Pack provides a set of reorganization utilities to reorganize online DEDB areas. These utilities are designed for optimal online system performance, while retaining a consistent view of IMS data. The reorganization processes are accomplished without taking the DEDB areas offline and without

disrupting applications that access the areas; therefore, applications can read and update data in the DEDB areas even while the utilities are running.

The following online reorganization solutions are provided by IMS Fast Path Online Tools:

- The Online Expert Reorganization utility evaluates UOWs in DEDB areas, ranks the UOWs, and reorganizes a user-specified number of highly ranked UOWs.
- The Online Area Extender utility dynamically extends the size of the DEDB area. You can specify the portion of the area to extend: the independent overflow (IOVF) portion, the sequential dependent (SDEP) portion of the DEDB area, or both.

These utilities can be run as stand-alone utilities, but if you use the Online Space Management utility, you can run both utility processes (Online Expert Reorganization utility process and Online Area Extender utility process) in one job step.

IMS Fast Path Solution Pack also provides the Online Structure Change utility. You can use the Online Structure Change utility to restructure online DEDB or areas with minimal impact to database availability. The utility supports changing DBD descriptions, randomizing modules, and segment edit/compression routines.

## Tuning capability

IMS Fast Path Solution Pack provides a tuning capability that simplifies reorganization tasks even further. The FPA Tune function helps you determine the effective database definitions by evaluating the potential benefits, or impact, of changes to an existing DEDB without the overhead of unloading and reloading the databases. You can use this function to measure the effectiveness of reorganizing fragmented free space or of changing new database definitions without reorganizing the areas. With this function, you do not need to generate new ACBLIBs; database definitions are specified by function keywords, and you can identify the optimal definitions by changing only the function keywords and rerunning the job. By ensuring that your new database definition is effective before reorganizing your database, you can avoid rerunning reorganization jobs that might be caused by inadequate database definitions.

With most of the previously mentioned functions, you can take image copies, validate database pointers, and obtain statistical information reports of the reorganized databases in a single job step. The solutions that are provided in IMS Fast Path Solution Pack help you maintain the health of your databases, improve your productivity, and achieve a smaller maintenance window.

## Verify the integrity of all IMS pointer values and analyze the space utilization of the database

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IMS Fast Path Solution Pack helps you efficiently manage many database maintenance activities. Using IMS Fast Path Solution Pack on daily or weekly basis helps ensure that your database pointers are error free by alerting you when a database needs to be reorganized.

IMS Fast Path Solution Pack provides the Analyze function of IMS Fast Path Advanced Tool and the Online Pointer Checker utility of IMS Fast Path Online Tools to verify the integrity of pointer values and analyze the space utilization of the DEDB areas. These functions analyze multiple DEDB areas and provide information about the DEDB areas in a single job step. The information reveals potential errors and provides space utilization statistics that can help you reduce the amount of time that you spend diagnosing and repairing problems. The Online Pointer Checker utility uses an online DEDB area as direct input, which means that the database area can remain fully accessible to users while pointer checking is being performed. Conversely, the Analyze function is used to evaluate offline DEDB areas. This function can process multiple DEDB areas concurrently. The Analyze function can process multiple DEDB areas more quickly than the Online Pointer Checker utility can. The Analyze function can also use image copy data sets as direct input, which means that you can run the Analyze function to take image copies of the online DEDB areas, use the image copies as input, and analyze the online DEDB areas through their image copies. By using this method, you can analyze online DEDB areas without affecting the online applications. With both functions, you can include image copy processing in the same job step to take image copies of the areas while the pointer checking process is running.

If you need to tune the database or if errors were revealed as a result of running these pointer checking functions, the following utilities can help you tune or repair your database:

- Use the FPA Tune function to tune your database. The FPA Tune function facilitates multiple iterations of the database tuning process, which allows you to select physical database attributes that meet your performance and space utilization requirements.
- Use the Database Repair Facility to repair the area. Database Repair Facility helps you repair the DEDB area that contains pointer or data errors.

The combined capabilities that are provided in IMS Fast Path Solution Pack provide a powerful set of productivity aids that help you detect and correct database errors quickly, and then repair them with minimum downtime to your IMS environment. These tools facilitate system tuning and optimization tasks and help you maintain the data availability you need to help your business thrive.

## Backup databases

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Using image copies to create backup data is essential to the timely recovery of databases after a loss of data or a programming mistake. However, taking data offline can reduce user productivity and negatively impact your business.

IMS Fast Path Solution Pack provides IMS HP Image Copy to help you speed recovery time by supporting quick copy and restarting methods, and allows your system users to become more productive and avoid expensive losses from missed business opportunities.

This tool helps you by:

- Providing rapid image copy features that reduce the unavailability of database data sets.
- Enabling you to run the image copy process automatically when used with IMS Fast Path Advanced Tool or IMS Fast Path Online Tools.
- Creating image copies after the area is reorganized or extended by the Online Space Management utility. The area can remain online throughout the entire process.

## Manage IMS ACB/DBD/PSB/MFS libraries, RECON data sets, and IMS catalog

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Database administration and change management are the core responsibilities of DBAs. If not managed correctly, they can monopolize data center resources, waste valuable time, and can result in the generation of unwanted errors.

In managing the database administration and change management process, DBAs are faced with many challenges like how do I:

- Ensure that I complete all of the necessary steps when making a change?
- Manage and track the changes to the definitions of my database objects?
- Propagate changes to other database environments quickly?
- Prevent accidental misuse in production?

The answers to these questions are provided by IMS Library Integrity Utilities. This tool helps you by providing the features and functions that enable you to manage your ACB libraries, DBD libraries, PSB libraries, MFS libraries, libraries containing DFSMDA members, IMS catalog, IMS directory, and RECON data sets. These features and functions include:

- The IMS Advanced ACB Generator utility, which contains additional features and functions to help you manage your IMS ACB libraries more effectively and provides a high-speed generation process.
- The Consistency Checker utility, which helps you ensure that the necessary definitions in your IMS system have been created.
- The Integrity Checker utility, which protects your databases from corruption caused by using the wrong IMS control blocks for access.



- The Multiple Resource Checker utility, which helps you identify the resources that contain different definitions across multiple sets of RECON data sets or DBDLIBs, PSBLIBs, and ACBLIBs.
- The Catalog Manager utility, which helps you ensure that the DBDs and PSBs in the IMS catalog are maintained correctly by validating the consistency of DBDs and PSBs in the ACB libraries with those in the IMS catalog.
- The MDA Reversal utility, which converts DFSMDA members back into DFSMDA macros and generates a report that contains a list of DFSMDA members.

## Store tool reports in a central repository for better search

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DBAs use many utilities to maintain the health of their databases. But how do they manage the reports that were generated by these utilities? Through their daily database maintenance tasks, various types of reports might be generated and accumulated. Managing and searching these accumulated reports can be cumbersome.

Many of the IMS Tools products that are provided in IMS Fast Path Solution Pack can store their reports in a central repository that is managed by IBM IMS Tools Base IMS Tools Knowledge Base.

IMS Tools Knowledge Base helps you locate the target report for a specific database quickly and easily:

- You can use the IMS Tools Knowledge Base ISPF user interface to manage and display the stored reports.
- The ISPF user interface provides a powerful report search capability that uses indexes that were added to the stored reports. Each report that is stored in the repository is assigned predefined search indexes that are associated with the resource that was processed during the product job. The index information includes the database DBD name, the area name, the date and time, the job name and the job step name, and the user ID under which the job was submitted.
- You can access the historical reports on respective database resources through the ISPF interface.

## Automate sensory data collection and exception detection

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Typically, identifying opportunities for tuning DEDB areas requires highly skilled DBA expertise that involves analyzing detailed analysis reports, identifying exceptional states of the areas, and determining the best approach to recover the areas in a good condition.

IBM IMS Tools Base for z/OS Autonomics Director assists you in identifying and performing the functions that are needed to maintain the health of DEDB areas.

The Autonomics Director scenario is based on sensor data that is derived as a by-product of the Analyze function of IMS Fast Path Advanced Tool, the Online Pointer Checker utility, the Online Space Management utility, and IMS HP Image Copy jobs. The sensor data can also be collected by Stand-alone Database Sensor.

Autonomics Director with IMS Fast Path Solution Pack provides:

- Automatic and consistent collection of sensor data related to the state of DEDB areas
- Automatic and consistent analysis of the state of DEDB areas against user-defined threshold criteria
- Generation of recommended actions for subject areas based on user-defined policies and thresholds
- Automatic reorganization and extension of DEDB areas based on user-defined policies and thresholds

## Aggregate information about database resources on a graphical user interface

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Analyzing the figures in analysis reports and identifying the state of DEDB areas can be a complicated task that requires a tremendous amount of a DBA's time and effort.

The IMS Administration Foundation features of IBM Unified Management Server for z/OS consolidates key IMS statistics into an intuitive, graphical web interface.

You can view aggregate information for customizable groups of databases as well as the following types of detailed information for individual databases including individual DEDB areas:

- Graphical charts that show historical sensor data that is collected by IMS Tools
- Database exceptions that are detected by Autonomics Director through the automated analysis of database state and recommended resolutions
- Various reports that are generated by IMS Tools

If you use the DBD and PSB Map feature in IMS Administration Foundation, you can also view the following information:

- Graphical view of the database structure
- Graphical view of the program specification
- DBD and PSB source
- Relation between DBDs and logical DBDs, and DBDs and PSBs (cross reference feature)

The cross reference feature helps you identify how DBDs and PSBs are related to each other. You can use this feature to identify and analyze the following resources:

- Logical DBDs that refer to a specific DBD.
- PSBs that refer to a specific DBD or a logical DBD.
- Source DBDs that each PCB of PSB refers to.

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## Chapter 3. Migration considerations

If you have one or more of the products that are included in IMS Fast Path Solution Pack installed on your system or if you have an earlier release of IMS Fast Path Solution Pack installed on your system, complete the migration tasks.

In addition to IMS High Performance Fast Path Utilities, IMS Fast Path Solution Pack for z/OS 2.1 includes the following products:

- IMS High Performance Image Copy for z/OS 4.2
- IMS Library Integrity Utilities for z/OS 2.2

IMS Fast Path Solution Pack also includes the following components:

- Database Sensor
- Database Repair Facility

### Topics:

- [“Migrating from an earlier release of IMS Fast Path Solution Pack” on page 21](#)
- [“Migrating from individual products ” on page 22](#)

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## Migrating from an earlier release of IMS Fast Path Solution Pack

If you have been using an earlier release of IMS Fast Path Solution Pack, complete the following steps to migrate to IMS Fast Path Solution Pack 2.1.

### Procedure

1. Determine the SMP/E CSI zone to install IMS Fast Path Solution Pack 2.1.

IMS Fast Path Solution Pack 2.1 can be installed in the same SMP/E CSI zone that is used for the earlier release of IMS Fast Path Solution Pack that you have been using or in a different SMP/E CSI zone.

2. If you plan to install IMS Fast Path Solution Pack in the same SMP/E CSI zone, complete the following steps.

- a) Create a backup copy of all SMP/E data sets, target libraries, and distribution libraries.

Installing IMS Fast Path Solution Pack 2.1 into the same SMP/E CSI zone replaces existing IMS Fast Path Solution Pack resources with 2.1 resources. Make sure you create a backup copy of all the data sets and libraries.

- b) If you plan to reuse all the data sets that you have been using with an earlier release of IMS Fast Path Solution Pack in IMS Fast Path Solution Pack 2.1 environment, ensure that all the required libraries, which are described in the *Program Directory for IBM IMS Fast Path Solution Pack for z/OS 2.1*, GI13-5905, exist.

The required size of data sets in IMS Fast Path Solution Pack 2.1 can be larger than the size required in earlier releases. See the *Program Directory for IBM IMS Fast Path Solution Pack for z/OS 2.1*, GI13-5905, and determine the required size for the data sets. If the size of the data sets is insufficient, increase the size.

3. If any of the following started tasks or servers are running, stop it:

- IMS Tools Base: IMS Tools Knowledge Base
- IMS Tools Base: Autonomics Director (IAV\*)
- IMS Tools Base: Distributed Access Infrastructure TCP server
- IMS Tools Base: Distributed Access Infrastructure TAS (Tools Access Server)
- IMS Tools Base: Distributed Access Infrastructure subordinate TAS (SOT)

- UMS server (Unified Management Server instance)
4. Install the latest version of IBM IMS Tools Base for z/OS in the target SMP/E CSI zone. For SMP/E installation procedure, see the *Program Directory for IBM IMS Tools Base for z/OS*, GI10-8819.  
 IMS Fast Path Solution Pack 2.1 requires IMS Tools Base for z/OS 1.7 or later. IMS Tools Base must be installed before IMS Fast Path Solution Pack 2.1 can be installed.
  5. Install IMS Fast Path Solution Pack 2.1 by following the instructions in the *Program Directory for IBM IMS Fast Path Solution Pack for z/OS 2.1*, GI13-5905.  
 If you are installing IMS Fast Path Solution Pack 2.1 into the same SMP/E CSI zone as where the earlier release of IMS Fast Path Solution Pack is installed, you do not need to install the tools that you already installed with the earlier release of IMS Fast Path Solution Pack.
  6. Apply maintenance to all the tools and components of IMS Tools Base and IMS Tools that you use and make sure that they are at the latest maintenance level.
  7. Migrate the IMS Tools Base components by using IMS Tools Setup.

Migration of IMS Tools Base components can be achieved by using IMS Tools Setup. IMS Tools Setup is a function that helps you quickly and efficiently perform the required post-SMP/E-installation customization process for IMS Tools solution pack products.

For instructions, see the topic "[Migrating from IMS Tools Base 1.6 to IMS Tools Base 1.7](#)" in the *IMS Tools Base Configuration Guide*. IMS Tools Setup also covers migration and customization of IMS Fast Path Solution Pack products.

If you need to customize IMS Fast Path Solution Pack products manually, follow the steps in [Chapter 6, "Customizing IMS Fast Path Solution Pack,"](#) on page 33 after you migrate IMS Tools Base components. Some of the customization steps that were done when you customized an earlier release of IMS Fast Path Solution Pack can be bypassed. However, because IMS Fast Path Solution Pack 2.1 provides new functions and features, review all the customization steps and complete the steps that are required for your environment.

## Migrating from individual products

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If you have been using one or more of the products included in IMS Fast Path Solution Pack, complete the following steps to migrate to the IMS Fast Path Solution Pack 2.1 environment.

### Procedure

1. Determine the SMP/E CSI zone to install IMS Fast Path Solution Pack 2.1.  
 IMS Fast Path Solution Pack 2.1 can be installed in the same SMP/E CSI zone that is used for the existing product or in a different SMP/E CSI zone.
2. If you plan to install IMS Fast Path Solution Pack in the same SMP/E CSI zone, create a backup copy of all SMP/E data sets, target libraries, and distribution libraries.  
 Installing IMS Fast Path Solution Pack 2.1 into the same SMP/E CSI zone replaces resources of the existing products with IMS Fast Path Solution Pack 2.1 resources. Make sure you create a backup copy of all the data sets and libraries.
3. Install the latest version of IBM IMS Tools Base for z/OS in the target SMP/E CSI zone. For SMP/E installation procedure, see the *Program Directory for IBM IMS Tools Base for z/OS*, GI10-8819.  
 IMS Fast Path Solution Pack 2.1 requires IMS Tools Base for z/OS 1.7 or later. IMS Tools Base must be installed before IMS Fast Path Solution Pack 2.1 can be installed.
4. Install IMS Fast Path Solution Pack 2.1 by following the instructions in the *Program Directory for IBM IMS Fast Path Solution Pack for z/OS 2.1*, GI13-5905.
5. Apply maintenance to all the tools and components of IMS Tools Base and IMS Tools that you use and make sure that they are at the latest maintenance level.
6. Migrate the IMS Tools Base components by using IMS Tools Setup.

The individual products that you have been using may previously required older versions of IMS Tools Knowledge Base, IMS Tools Online System Interface, and IMS Tools Generic Exits than what is required by this release of IMS Fast Path Solution Pack. These common tools, along with several other tools are now delivered with IMS Tools Base.

Migration of IMS Tools Base components can be achieved by using IMS Tools Setup. IMS Tools Setup is a function that helps you quickly and efficiently perform the required post-SMP/E-installation customization process for IMS Tools solution pack products.

For instructions, see the topic "[Migrating from IMS Tools Base 1.6 to IMS Tools Base 1.7](#)" in the *IMS Tools Base Configuration Guide*. IMS Tools Setup also covers migration and customization of IMS Fast Path Solution Pack products.

All the components of IMS Tools Base are compatible with earlier releases of IMS Tools Knowledge Base, IMS Tools Online System Interface, and IMS Tools Generic Exits.

If you need to customize IMS Fast Path Solution Pack products manually, follow the steps in [Chapter 6, "Customizing IMS Fast Path Solution Pack,"](#) on page 33 after you migrate IMS Tools Base components. Some of the customization steps that were done when you customized individual IMS Tools can be bypassed. However, because IMS Fast Path Solution Pack 2.1 provides new functions and features, review all the customization steps and complete the steps that are required for your environment.



---

## Chapter 4. Installing IMS Fast Path Solution Pack

Before you install IMS Fast Path Solution Pack, you must first complete the SMP/E installation of IMS Tools Base.

Complete the SMP/E installation of the products in the following order:

1. [“Installing the required common tools from IMS Tools Base” on page 25](#)
2. [“Installing the components of IMS Fast Path Solution Pack” on page 25](#)
3. [“Gathering the data set names of IMS Fast Path Solution Pack and IMS Tools Base” on page 26](#)
4. [“Verifying the installation” on page 29](#)

---

### Installing the required common tools from IMS Tools Base

Many of the tools and functions included in IMS Fast Path Solution Pack require the use of the common tools that are included in IMS Tools Base.

The following common tools integrate with the tools and functions in IMS Fast Path Solution Pack:

- Autonomics Director
- Distributed Access Infrastructure
- IMS Tools Common Services
- IMS Tools Knowledge Base
- Policy Services

To perform the SMP/E installation, see the *Program Directory for IBM IMS Tools Base for z/OS*, GI10-8819. This process allocates and downloads the target and distribution libraries and performs the SMP/E installation of the tools included in IMS Tools Base.

Optionally, if you are installing IMS Tools Base 1.7 or later, you can install IMS Administration Foundation, which activates the IMS administration web-browser interface of IBM Unified Management Server for z/OS to enable the management of IMS systems and resources. To install IMS Administration Foundation, install IBM Unified Management Server for z/OS by following the instructions in the *Program Directory for IBM Unified Management Server for z/OS*, GI13-5914, and then follow the instructions in the *Program Directory for IBM IMS Tools Base for z/OS*, GI10-8819.

After you install IMS Tools Base, continue with the installation of IMS Fast Path Solution Pack before configuring each tool included in IMS Tools Base.

---

### Installing the components of IMS Fast Path Solution Pack

Install the IMS Fast Path Solution Pack libraries (SHFPxxxx, SHPSxxxx, SFABxxxx) provided to you by IBM.

The IMS High Performance Fast Path Utilities component is installed in a common set of target and distribution libraries provided with IMS Fast Path Solution Pack. Components of other tools are installed in separate target and distribution libraries.

To perform the SMP/E installation, see the *Program Directory for IBM IMS Fast Path Solution Pack for z/OS 2.1*, GI13-5905.

The following table lists the data sets of the target libraries distributed in IMS Fast Path Solution Pack.

---

*Table 2. Data sets of the target libraries for IMS Fast Path Solution Pack*

---

Type	Name	Description	Local DSN name
CLIST	SFABCLIB	Executable CLIST members for Database Repair Facility	

---

Table 2. Data sets of the target libraries for IMS Fast Path Solution Pack (continued)

Type	Name	Description	Local DSN name
LMOD	SFABLMDO	Executable load library for Database Repair Facility	
	SHFPLMDO	Executable load library for IMS HP Fast Path Utilities	
	SHPSLMDO	Executable load library for IMS HP Image Copy and IMS Library Integrity Utilities	
MAC	SHFPMACO	Distributed product macros for IMS HP Fast Path Utilities	
	SHPSMACO	Distributed product macros for IMS Library Integrity Utilities	
MESSAGE	SFABMLIB	ISPF messages for Database Repair Facility	
PANEL	SFABPLIB	ISPF panels for Database Repair Facility	
SAMPLE	SHFPBASE	SMP/E JCL members for installing IMS Fast Path Solution Pack	
	SHFPJCL0	IVP JCL member and sample installation JCL members for individual tools for IMS HP Fast Path Utilities	
	SHFPSAMP	Sample JCL members, exit codes, and cataloged procedures for IMS HP Fast Path Utilities	
	SHPSBASE	SMP/E JCL members for installing IMS HP Image Copy and IMS Library Integrity Utilities	
	SHPSJCL0	IVP and customization JCL members for IMS HP Image Copy and IMS Library Integrity Utilities	
	SHPSSAMP	Sample JCL members, exit codes, and cataloged procedures for IMS HP Image Copy and IMS Library Integrity Utilities	
File system path	SHPSIHFS	File system path for IMS Library Integrity Utilities  Maps to: <i>pathprefix</i> /usr/lpp/InstallationManagerRepository/H27P220/IBM/	

## Gathering the data set names of IMS Fast Path Solution Pack and IMS Tools Base

After you installed all the components of IMS Tools Base and IMS Fast Path Solution Pack, record your data set names.

Fill in the following tables with the data set names for modifying the procedures and JCL members.

Subsections:



- [“Data set names of IMS Fast Path Solution Pack” on page 27](#)
- [“Data set names of IMS Tools Base” on page 28](#)
- [“Data set names of IMS libraries” on page 28](#)
- [“Data set names of other libraries” on page 28](#)
- [“Data set names of your program libraries” on page 29](#)

## Data set names of IMS Fast Path Solution Pack

The SHFPxxxx libraries include the data sets for the following IMS Fast Path Solution Pack tools:

- IMS HP Fast Path Utilities
- Database Sensor

*Table 3. Data set names of IMS HP Fast Path Utilities (SHFPxxxx library)*

<b>Name</b>	<b>Description</b>	<b>Your data set name</b>
SHFPLMD0	Executable load library	
SHFPBASE	SMP/E JCL members for installation	
SHFPJCL0	IVP JCL member and sample installation JCL members for individual tools	
SHFPSAMP	Sample JCL members, exit codes, and cataloged procedures	
SHFPMAC0	Distributed product macros	

The SHPSxxxx libraries include the data sets for IMS HP Image Copy and IMS Library Integrity Utilities.

*Table 4. Data set names of IMS HP Image Copy and IMS Library Integrity Utilities (SHPSxxxx library)*

<b>Name</b>	<b>Description</b>	<b>Your data set name</b>
SHPSLMD0	Executable load library	
SHPSBASE	SMP/E JCL members for installation	
SHPSJCL0	IVP and customization JCL members	
SHPSSAMP	Sample JCL members, exit codes, and cataloged procedures	
SHPSMAC0	Distributed product macros	

The SFABxxxx libraries include the data sets for Database Repair Facility.

*Table 5. Data set names for Database Repair Facility (SFABxxxx library)*

<b>Name</b>	<b>Description</b>	<b>Your data set name</b>
SFABLMD0	Executable load module library for Database Repair Facility	
SFABCLIB	Executable CLIST members for Database Repair Facility	
SFABMLIB	ISPF messages for Database Repair Facility	
SFABPLIB	ISPF panels for Database Repair Facility	

## Data set names of IMS Tools Base

The following table summarizes the libraries of IMS Tools Base.

*Table 6. Data set names of IMS Tools Base*

Name	Description	Your data set name
SAIILINK	Executable load module library for Distributed Access Infrastructure	
SFOILOAD	Executable load module library for IMS Tools Online System Interface and IMS Tools Common Pauser	
SGLXLOAD	Executable load module library for IMS Tools Generic Exits	
SHKTLOAD	Executable load module library for Autonomics Director, IMS Tools Knowledge Base, and Policy Services	
SHKTCEXE	Executable CLIST members for IMS Tools Knowledge Base	

## Data set names of IMS libraries

The following table summarizes the IMS resources.

*Table 7. Data set names of IMS resources*

Name	Your data set name
IMS SDFSRESL	
IMS SDFSMAc	
IMS SMP/E CSI data set	
IMS PROCLIB	
DBDLIB	
PSBLIB	
ACBLIB	
MDALIB	
USERLIB (see <a href="#">Note</a> )	
RECON1	
RECON2	
RECON3	

**Note:** USERLIB is the load module library where your randomizer, segment compression exits, user exit routines, and other resources exist.

## Data set names of other libraries

The following table summarizes other resources.

---

Table 8. Data set names of other resources

---

Name	Your data set name
GDDM (SADMMOD)	
ISPF (SISPLPA)	
ISPF (SISPLOAD)	
LE (SCEELKED)	
MVS PROCLIB	

---

### Data set names of your program libraries

Use the following table to record the program libraries in which your user exit modules, randomizers, compression routines, and site default modules are stored.

---

Table 9. Data set names of your program libraries

---

Description	Your data set name

---

## Verifying the installation

---

After completing all the installation requirements, run the installation verification procedure (IVP) job for IMS Fast Path Solution Pack.

The IVP member is HFPCIVP in the SHFPJCL0 data set. This IVP job verifies IMS Fast Path Solution Pack and its individual products. The job verifies that all installation tasks have been completed successfully and that you are ready to configure the IMS Fast Path Solution Pack environment.

APF-authorize the SHFPLMD0 library. Then, edit the HFPCIVP member by following the instructions within the member and run the job.



---

# Chapter 5. Initial product customization using IMS Tools Setup

IMS Tools Setup is a function that helps you quickly and efficiently perform the required post-SMP/E-installation customization process for IMS Tools solution pack products. IMS Tools Setup is provided by IBM IMS Tools Base.

## What does IMS Tools Setup do?

After the selected IMS Tools solution pack products have been installed into SMP/E data sets, IMS Tools Setup provides a process to simplify the initial configuration that is required to begin using the products. IMS Tools Setup generates JCL members that you then submit as jobs, or perform as tasks, to complete the customization process.

IBM IMS Tools Base components are also configured and customized during the IMS Tools Setup process. IBM IMS Tools Base provides important supporting components and infrastructure that are required for the operation of many IMS Tools functions, such as storage repositories, autonomies, and interaction with IMS.

The goal of IMS Tools Setup is to greatly ease the time and effort it takes to have IMS Tools products up and running in your environment.

IMS Tools Setup is intended only for initial product installations, first-time users, and product evaluations. IMS Tools Setup is not intended for maintenance purposes.

## IMS Tools products that can use IMS Tools Setup

The following IMS Tools products and solution packs can use IMS Tools Setup for initial configuration:

- IBM IMS Tools Base
- IBM IMS Database Solution Pack for z/OS
- IBM IMS Fast Path Solution Pack for z/OS
- IBM IMS Recovery Solution Pack for z/OS
- IBM IMS Database Utility Solution for z/OS
- IBM IMS Administration Tool for z/OS
- IBM IMS Cloning Tool for z/OS
- IBM IMS Program Restart Facility for z/OS

## Starting IMS Tools Setup

The IMS Tools Setup function (HKTQSETU) can be found in IBM IMS Tools Base. You can start the function by running the following REXX EXEC:

```
EXEC 'smpehlq.SHKTCEXE(HKTQSETU)' 'HLQ(smpehlq)'
```

**Note:** *smpehlq* is the high-level qualifier for the IMS Tools Base SMP/E data sets.

The IMS Tools Setup ISPF panels provide an organized and logical approach to the customization tasks. The panels explain the operation and sequence of each member that is generated in the CUSTJCL data set. The correct JCL job and task operation order is very important.

Each panel contains embedded panel-context and individual field-context Help information. All information about using IMS Tools Setup is contained in the embedded Help. There is no separate user guide.

While using the IMS Tools Setup function to install IMS Tools products or to migrate your products from an earlier release to a later release, you need to specify the names of the libraries, or data sets, that are required for each IMS Tools product. Use the worksheets in the topic "[Data set names for IMS Tools Setup](#)" in the *IMS Tools Base Configuration Guide* to make a summary of the data set names that will be used in your environment.

## Completing IMS Tools Setup

After you run the HKTQSETU REXX EXEC, you can refer to the \$\$READ member in the generated *hlq.CUSTJCL* data set to view summary information about the JCL members that were generated. Additionally, all individual *hlq.CUSTJCL* members contain detailed descriptions of the functions for each job.

Each of the generated JCL members begin with the number sign (#) and are named in the logical sequence of operation. Any members ending with the at sign (@) require manual steps. You must begin with the first *#xxxx* member and submit the JCL job or perform the task. After that job or task completes, you continue on to the next member and submit that JCL job or perform that task, and so forth.

The first few members are all SYSPROG related (APF, LPA, SSN, MVSPPT), followed by security related members, TCP/IP administration, DBA related members, and others.

You must process all members in the correct order to complete the full customization task properly.

Each JCL member has its own descriptive comment section that explains what the member does and which group it might belong to.

# Chapter 6. Customizing IMS Fast Path Solution Pack

Before using any of the tools that are included in IMS Fast Path Solution Pack, all the tools must be customized. Use the following topics to manually customize tools in IMS Fast Path Solution Pack. These topics also cover customization of common tools that are included in IMS Tools Base for z/OS.

## Customization checklist

Use the following checklist to customize the tools and components for IMS Fast Path Solution Pack.

Table 10. Customization checklist

Status	Task
	1. <a href="#">“Configuring IMS Tools Base ” on page 33</a>
	2. <a href="#">“APF authorizing the program libraries” on page 36</a>
	3. <a href="#">“Performing security-related tasks” on page 37</a>
	4. <a href="#">“Obtaining XCF group names for IMS Tools Base servers” on page 42</a>
	5. <a href="#">“Updating sample procedures and JCL” on page 43</a>
	6. <a href="#">“Setting up Unified Management Server for IMS Administration Foundation” on page 44</a>
	7. <a href="#">“Setting up the Online Structure Change utility” on page 44</a>
	8. <a href="#">“Setting up the Integrity Checker utility of IMS Library Integrity Utilities” on page 52</a>
	9. <a href="#">“Setting up the ISPF interface” on page 81</a>

## Configuring IMS Tools Base

Identify the IMS Tools Base components that will be required in your environment and configure the components.

### About this task

Many of the tools included in IMS Fast Path Solution Pack integrate with the components that are included in IMS Tools Base. The following IMS Tools Base components might be used in your IMS Fast Path Solution Pack environment.

#### Autonomics Director

Autonomics Director provides automation of IMS database monitoring based on an understanding of the current state of your IMS databases. Autonomics Director must be configured if you want Database Sensor to send a sensor data collection notification to Autonomics Director. Autonomic Director will use this notification as a trigger to start analyzing and generating recommendations for the database.

#### Distributed Access Infrastructure

Distributed Access Infrastructure acts as a gateway for communication between distributed platforms and z/OS. It operates in a z/OS environment and uses a TCP Server, the Tools Access Server (TAS), and the Subordinate TAS (SOT) to provide distributed clients access to IMS Tools through TCP/IP socket communication. Distributed Access Infrastructure is used to provide TCP gateway for various IMS Tools services that are provided by IMS Administration Foundation. Those services include:

- Viewing exceptions monitored by using Autonomic Director monitor list
- Viewing sensor data history in trend charts
- Viewing IMS Tools utility reports

- Viewing sources and tree structures defined in DBDs and PSBs

Distributed Access Infrastructure must be configured to use IMS Administration Foundation.

### IMS Tools Common Services

IMS Tools Generic Exits provides the ability to define multiple IMS exits and enable them to be called within the IMS control region. One of the exits supported is the Partner Product exit routine (DFSPPUEO). This exit is required to use IMS Tools Online System Interface.

IMS Tools Online System Interface is a command interface that allows IMS Tools to interface with all supported versions of IMS.

IMS Tools Common Pauser enables IMS Tools products to use the BMP pause feature and, optionally, the CICS and ODBA application pause feature, which temporarily stop active BMP applications, CICS applications, and ODBA applications that access a database to which you want to make changes, thereby enabling those products to restructure the database while the BMP, CICS, and ODBA applications are suspended.

### IMS Tools Knowledge Base

IMS Tools Knowledge Base is the foundational infrastructure that provides a centralized information management environment for IMS Tools products and Policy Services. IMS Tools Knowledge Base allows you to store, manage, and access resources (such as reports, sensor data, policies, rules, notification lists, and decoded DBDs) that are generated or used by any tool product that has been enabled and registered to participate in an IMS Tools Knowledge Base information management environment. IMS Tools Knowledge Base must be configured if you want to store reports and sensor data in central repositories, use autonomics capabilities provided by Autonomics Director, or use the graphical web interface of IMS Administration Foundation.

### Policy Services

Policy Services is a core IMS Tools technology that can monitor specific database state by evaluating the sensor data collected by an IMS Tools product, and by providing a response to any conditions that exceed the threshold values specified for this state. Policy Services must be configured if you plan to automate sensory data collection and exception detection.

## Procedure

1. Identify which IMS Tools Base components will be used in your environment.

The following table shows the IMS Tools Base components and whether they are supported by the tools and utilities of IMS Fast Path Solution Pack. IMS Tools Base components that are not listed in the table are not used by the tools and utilities of IMS Fast Path Solution Pack.

IMS Tools	Autonomics Director	Distributed Access Infrastructure	IMS Tools Common Services	IMS Tools Knowledge Base	Policy Services
IMS Fast Path Advanced Tool	Optional	Optional	Optional	Optional	Optional
IMS Fast Path Basic Tools	-	-	-	-	-
IMS Fast Path Online Tools	Optional	Optional	Optional	Optional	Optional
Online Space Management utility	Optional	Optional	Optional	Optional	Optional
Online Structure Change utility	-	Optional	Required	Optional	-
IMS HP Image Copy	Optional	Optional	Optional	Optional	Optional



<b>IMS Tools</b>	<b>Autonomics Director</b>	<b>Distributed Access Infrastructure</b>	<b>IMS Tools Common Services</b>	<b>IMS Tools Knowledge Base</b>	<b>Policy Services</b>
IMS Library Integrity Utilities	-	-	Optional	-	-
IMS Library Integrity Utilities extension (DBD/PSB Map Viewer)	-	Required	-	Required	-
Database Sensor	Optional	Optional	Optional	Required	Optional
Database Repair Facility	-	-	-	-	-

2. Follow the instructions in the *IMS Tools Base Configuration Guide* to configure the IMS Tools Base components that you identified in step “1” on page 34.

The following considerations and additional information help you configure the IMS Tools Base components for use with IMS Fast Path Solution Pack.

### **IMS Tools Knowledge Base**

Register IMS Tools products to IMS Tools Knowledge Base to enable the following functions:

- Store product reports in the IMS Tools Knowledge Base repository
- Collect and store sensor data for sensor data evaluation
- IMS autonomics capabilities
- JCL generation of IMS Administration Tool

For more information about configuring IMS Tools Knowledge Base and registering IMS Tools products, see the *IMS Tools Base Configuration Guide*.

**Tip:** IMS Fast Path Solution Pack provides the following JCL samples that you can use to register IMS Fast Path Solution Pack products and reports to IMS Tools Knowledge Base:

- IMS HP Fast Path Utilities: HFPCITKB in SHFPSAMP
- IMS HP Image Copy: FABJITKB in SHPSSAMP
- IMS Library Integrity Utilities: FABLITKB in the SHPSSAMP

### **Autonomics Director**

While you configure Autonomics Director, you will be guided to create skeleton JCL for Database Sensor. You can use the sample skeleton JCL, HFPOJCL2, in the SHFPSAMP library to do so.

### **IMS Tools Common Services**

#### **Important:**

- If you plan to use the Online Structure Change utility, instead of completing the steps in the *IMS Tools Base Configuration Guide* to configure IMS Tools Generic Exits and IMS Tools Online System Interface, complete the steps in “[Configuring IMS Tools Online System Interface](#)” on page 51.
- If you plan to enable the BMP, CICS, and ODBA application pause features with the Online Structure Change utility, see “[Configuring IMS Tools Common Pauser](#)” on page 52 before you configure IMS Tools Common Pauser.

## APF authorizing the program libraries

You must make certain changes to your MVS system to allow IMS Fast Path Solution Pack to operate with the required level of authority.

### About this task

Before using any of the tools in IMS Fast Path Solution Pack, you must ensure that all the authorizations are set up correctly for your environment. The following libraries require authorized program facility (APF) authorization:

- The library that contains IMS Fast Path Solution Pack executable modules
- All tools that are part of IMS Fast Path Solution Pack that are not in the SHFPLMD0 library
- The libraries of related common tools of IMS Tools Base
- The libraries that contain the randomizers, compression routines, user exit modules, and site default table modules, if they exist

### Procedure

1. Add the required libraries to your MVS APF list.

Add the libraries in the following table to your MVS APF list and any other library that is specified in the STEPLIB of each batch utility job or IMS control region.

*Table 11. Load libraries to be APF-authorized*

<b>Library</b>	<b>Descriptions</b>
SAIILINK	Distributed Access Infrastructure
SHFPLMD0	IMS Fast Path Solution Pack: IMS HP Fast Path Utilities
SHPSLMD0	IMS HP Image Copy and IMS Library Integrity Utilities
SGLXLOAD	IMS Tools Generic Exits
SFOILOAD	IMS Tools Online System Interface and IMS Tools Common Pauser
SHKTLOAD	Autonomics Director, IMS Tools Knowledge Base, Distributed Access Infrastructure, and Policy Services

2. Complete either of the following steps to activate the updated APF list:
  - To temporarily APF-authorize the libraries, use the SETPROG APF system command. For more information, see *z/OS MVS System Commands*.
  - To permanently APF-authorize the libraries, add the libraries to the APF statement in the PROGxx member of SYS1.PARMLIB and re-IPL the system. For more information, see the *z/OS MVS Initialization and Tuning Reference*.

## Performing security-related tasks

IMS Fast Path Solution Pack requires specific RACF and security settings. You must ensure that all products have the necessary security authorizations in order for them to operate correctly.

### Address space considerations

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. Therefore, 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
```

## Defining RACF (or equivalent security) authorization for IMS commands

You must define RACF (or equivalent security software) authorizations for Database Sensor, IMS Fast Path Advanced tool (FPA), IMS Fast Path Basic Tools (FPB), IMS Fast Path Online Tools (FPO), Online Space Management utility, Online Structure Change utility, and IMS HP Image Copy to operate.

### About this task

The Database Sensor, FPA, FPB, FPO, Online Space Management utility, Online Structure Change utility, and IMS HP Image Copy functions allow you to execute IMS commands through a batch job. IMS commands must be secured with RACF or other equivalent security software to control access to who can issue IMS commands. There are three different options for securing IMS commands through this feature. The information about IMS command authorization is defined in the IMS Tools Base IMS Tools Knowledge Base RECONID record.

### Procedure

In the **IMSCMD Security** field, which is located in the RECONID record, specify the type of security that you want to implement by entering one of these values:

#### NONE

No security authorization is performed. This value is intended for test environments only and should not be used in a secured environment. The security level of NONE allows anyone to issue any supported IMS command.

#### APPL

The RACF application (APPL) resource class is used for command security checking. This method uses the application resource class (APPL) to protect the IMS commands. The **RACF Class** field in the RECONID record indicates the specific application resource name, within the RACF APPL class, that is used for securing the IMS commands.

When you use the APPL resource class method, you must first define the application resource name (*applname* in the next example) to RACF. Define the application resource name to RACF by using the RDEFINE command, as shown in this example:

```
RDEFINE APPL applname UACC(NONE) AUDIT(NONE)
```

After you have defined the application resource name, your RACF administrator can permit users either READ or UPDATE levels of command authorization by using the PERMIT command, as shown in this example:

```
PERMIT applname CLASS(APPL) ID(userid) ACCESS(READ|UPDATE)
```

The *userid* specifies a particular RACF user or RACF group. ACCESS specifies either read-level access or update-level access. Read-level access allows a user to issue IMS commands that display IMS system information, and update-level access allows users to issue IMS commands that alter IMS system resources. The next table indicates which IMS commands are allowed and the corresponding level of access that is required to run them.

#### IMS

The IMS resource class is used for command security checking. This method uses the same IMS command security class that is used by the online IMS system. The **RACF Class** field in the RECONID record indicates the RACF security class that is used for securing IMS commands. This value must match the one that you specified to IMS using the **RCLASS=** keyword on the SECURITY macro. This method allows you to use the same security class that is used by your online IMS control region.

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

Tools and functions of IMS Fast Path Solution Pack issue 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 product jobs and the access levels that are required to issue the commands.

Command	Access level required	Product or tool
/CHECKPOINT	Update	Online Structure Change utility
/DBDUMP	Update	<ul style="list-style-type: none"><li>IMS Fast Path Advanced Tool</li><li>IMS HP Image Copy</li></ul>
/DBRECOVERY	Update	<ul style="list-style-type: none"><li>IMS Fast Path Advanced Tool</li><li>Online Structure Change utility</li><li>IMS HP Image Copy</li></ul>
/DISPLAY	Read	<ul style="list-style-type: none"><li>IMS Fast Path Online Tools</li><li>IMS HP Image Copy</li></ul>
/START	Read	<ul style="list-style-type: none"><li>IMS Fast Path Online Tools</li><li>Online Structure Change utility</li><li>IMS HP Image Copy</li></ul>
/STOP	Update	<ul style="list-style-type: none"><li>IMS Fast Path Online Tools</li><li>Online Structure Change utility</li></ul>
/RMxxxxx	Update	IMS Fast Path Online Tools
IMPORT DEFN SOURCE(CATALOG)	Update	Online Structure Change utility
INITIATE OLC	Update	Online Structure Change utility
QUERY MEMBER	Read	Online Structure Change utility

### DBRC API requests and DBRC commands

The following table summarizes the DBRC API requests and the DBRC commands that are used in product jobs.

DBRC API request or command	Product or tool
DBRC API - AUTH	<ul style="list-style-type: none"><li>IMS Fast Path Advanced Tool</li><li>Online Structure Change utility</li></ul>

<b>DBRC API request or command</b>	<b>Product or tool</b>
DBRC API - QUERY	<ul style="list-style-type: none"> <li>• IMS Fast Path Basic Tools</li> <li>• IMS HP Image Copy</li> <li>• IMS Library Integrity Utilities</li> </ul>
DBRC API - RELBUF	<ul style="list-style-type: none"> <li>• IMS Fast Path Basic Tools</li> <li>• IMS HP Image Copy</li> <li>• IMS Library Integrity Utilities</li> </ul>
DBRC API - START/STOP	<ul style="list-style-type: none"> <li>• IMS Fast Path Basic Tools</li> <li>• IMS HP Image Copy</li> </ul>
DBRC API - STARTDBRC/STOPDBRC	<ul style="list-style-type: none"> <li>• IMS HP Image Copy</li> <li>• IMS Library Integrity Utilities</li> </ul>
DBRC command - CHANGE	<ul style="list-style-type: none"> <li>• IMS Fast Path Advanced Tool</li> <li>• IMS Fast Path Online Tools</li> <li>• Online Space Management utility</li> <li>• Online Structure Change utility</li> <li>• IMS HP Image Copy</li> </ul>
DBRC command - DELETE	<ul style="list-style-type: none"> <li>• IMS Fast Path Online Tools</li> <li>• Online Space Management utility</li> <li>• Online Structure Change utility</li> <li>• IMS HP Image Copy</li> </ul>
DBRC command - INIT	<ul style="list-style-type: none"> <li>• IMS Fast Path Online Tools</li> <li>• Online Space Management utility</li> <li>• Online Structure Change utility</li> </ul>
DBRC command - LIST	<ul style="list-style-type: none"> <li>• IMS Fast Path Advanced Tool</li> <li>• IMS Fast Path Basic Tools</li> <li>• IMS Fast Path Online Tools</li> <li>• Online Space Management utility</li> <li>• Online Structure Change utility</li> <li>• IMS HP Image Copy</li> <li>• IMS Library Integrity Utilities</li> </ul>
DBRC command - NOTIFY	<ul style="list-style-type: none"> <li>• IMS Fast Path Advanced Tool</li> <li>• IMS Fast Path Online Tools</li> <li>• Online Space Management utility</li> <li>• Online Structure Change utility</li> <li>• IMS HP Image Copy</li> </ul>

For the access levels that are required to issue these requests and 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 requests, and DBRC commands, see *IMS Commands*.

## Defining RACF authority to dynamically allocate and catalog data sets

Set up the RACF authority to dynamically allocate and catalog data sets beginning with the high-level qualifier that you specified in the JCL and PROC members.

Here are some examples:

- Database data sets
- Index data sets
- Image copy data sets
- Work data sets

## Defining RACF or equivalent security authorization for IMS Fast Path Online Tools

If you are planning to use security validation, such as those provided by RACF, you must activate the security function.

Before any IMS Fast Path Online Tools (FPO) processing is run, RACF verifies that the user ID of the IFP utility is authorized to class IMSTxxx to run the required function, where xxx can be OPC (Online Pointer Checker), ODE (Online Data Extract), OAE (Online Area Extender), or ODM (Online DMAC Print). For OER (Online Expert Reorganization), if validation fails, the processing ends.

The following call is issued by the security module to validate that the user has sufficient authority to access the utility of FPO:

```
RACROUTE REQUEST=AUTH,APPL='FPX',ATTR=READ,
        CLASS='IMSTxxx',ENTITYX='imsid.dbname.areaname'
```

To activate security, you must run two tasks: activate CLASS IMSTxxx and set up the appropriate RACF permit list.

If RACF is being used, a system IPL is required to activate the updated class descriptor table.

The following figure is an example of the class descriptor entries, which must be added to the class descriptor table maintained by the RACF ICHERCDE utility.

```
IMSTxxx ICHERCDE CLASS=IMSTxxx,      +
        ID=128,                       +
        MEMBER=IMSMxxx,               +
        MAXLNTH=128,                  +
        OTHER=ANY,                    +
        POSIT=25,                     +
        OPER=NO,                      +
        RACLIST=DISALLOWED,           +
        GENLIST=DISALLOWED,          +
        DFTUACC=NONE                  +
IMSMxxx ICHERCDE CLASS=IMSMxxx,      +
        ID=129,                       +
        GROUP=IMSTxxx,                +
        MAXLNTH=128,                  +
        OTHER=ANY,                    +
        POSIT=25,                     +
        OPER=NO,                      +
        RACLIST=DISALLOWED,           +
        GENLIST=DISALLOWED,          +
        DFTUACC=NONE                  +
```

Figure 1. Example of the class descriptor entries for an FPO utility

The following figure shows an example provided to help you in setting up your RACF permit list for an FPO utility.

Remember, if you update the class descriptor table, you must IPL the system to activate it.

```
RDEFINE IMSTxxx imsid.dbname.areaname0 UACC(NONE)
RDEFINE IMSTxxx imsid.dbname.areaname1 UACC(NONE)
RDEFINE IMSTxxx imsid.dbname.areaname2 UACC(NONE)

PERMIT imsid.dbname.areaname0 CLASS(IMSTxxx) ID(userid1) ACCESS(UPDATE)
PERMIT imsid.dbname.areaname0 CLASS(IMSTxxx) ID(userid2) ACCESS(UPDATE)
PERMIT imsid.dbname.areaname1 CLASS(IMSTxxx) ID(userid1) ACCESS(UPDATE)
PERMIT imsid.dbname.areaname1 CLASS(IMSTxxx) ID(userid2) ACCESS(UPDATE)
```

Figure 2. Example to set up the FPO RACF permit list

## Obtaining XCF group names for IMS Tools Base servers

You must obtain the XCF group names for the IMS Tools Base server groups to set up JCL streams, cataloged procedures, and site default options for IMS Fast Path Solution Pack tools.

### XCF group name for the IMS Tools Knowledge Base servers

The XCF group name for the IMS Tools Knowledge Base servers must be specified in the JCL streams for IMS Fast Path Solution Pack tools to use one of the following services of IMS Tools Base directly from tools' jobs:

- IMS Tools Knowledge Base report repository service
- Policy Services
- Autonomics Director

For example, specify the ITKBSRVR parameter on the GLOBAL control statement of IMS Fast Path Advanced Tool. You can set default values for the run time options by using the installation default option to make the specification applied to all the run of IMS Fast Path Advanced Tool jobs, without specifying them in each JCL stream.

### XCF group name for the Autonomics Director servers

The XCF group name for the Autonomics Director servers must be specified in the JCL streams for IMS Fast Path Solution Pack tools to use the sensor data notification service from various database sensor functions of the tools.

For example, specify the ADXCFGRP parameter on the GLOBAL control statement of IMS Fast Path Advanced Tool. You can set default values for the run time options by using the installation default option to make the specification applied to all the run of IMS Fast Path Advanced Tool jobs, without specifying them in each JCL stream.

### XCF group name for the IMS Tools Online System Interface server tasks

The XCF group name for the IMS Tools Online System Interface server tasks must be specified in the JCL streams for IMS Fast Path Solution Pack tools to issue IMS commands from the tools' jobs.

For example, specify the TOIXCFGR=*grpname* parameter in the GLOBAL control statement of the ICEIN input of the IMS HP Image Copy, where *grpname* is the 5-character XCF group name. You can set default values for the runtime options by using the site default table to make the specification applied to all the run of IMS HP Image Copy jobs, without specifying them in each JCL stream.



## Updating sample procedures and JCL

Update the sample members in the SHFPSAMP library and the SHPSSAMP library.

### Updating the required sample members in the SHFPSAMP library

Copy the required sample members from the SHFPSAMP library to the JCLPDS data set and modify the members.

The SHFPSAMP library contains member HFPOJCL1, which is a JCL sample member for the Stand-alone Database Sensor. An instruction to modify the member is included in the member.

The SHFPSAMP library also contains member HFPOJCL2. You can use this JCL to run DB Sensor automatically by using the scheduling functions of Autonomics Director. See the topic "[Customizing skeleton JCL for Fast Path DB Sensor](#)" in the *IMS Tools Base Configuration Guide*.

### Updating the optional sample members in the SHFPSAMP library

The SHFPSAMP library also contains optional sample members for IMS Fast Path Basic Tools and IMS Fast Path Online Tools.

Table 12 on page 43 and Table 13 on page 44 provide lists of the sample members that are distributed in the IMS Fast Path Solution Pack sample library SHFPSAMP. Refer to the tables and determine which sample members you use. After you determine the members, copy the members to your IMS PROCLIB data set or system PROCLIB data set and modify the copied members. Each sample member contains an instruction on how to customize each member.

If you will not use these tools or none of the members is applicable to your usage, you do not need to copy and modify the sample members.

The following table summarizes the sample members for IMS Fast Path Basic Tools (FPB). Modify all these members if you plan to use FPB.

Table 12. Sample members for IMS Fast Path Basic Tools in the SHFPSAMP library

Sample member	Description	Type
FABAPC	Procedure to run the DEDB Pointer Checker utility of FPB	PROC
FABAPCS	Procedure to run the SDEP Space Utilization utility	PROC
FABBTA	Procedure to run the DEDB Tuning Aid utility of FPB	PROC
FABCRELD	Procedure to run the DEDB Reload utility of FPB	PROC
FABCUNLD	Procedure to run the DEDB Unload utility of FPB	PROC

The following table summarizes the sample members for the Online Pointer Checker utility and the Online Expert Reorganization utility of IMS Fast Path Online Tools (FPO). If you plan to use the FULLSTEP=NO option, or use SYSIN data sets as the utility input, modify members that are applicable to your usage.

**Tip:** The FULLSTEP=NO option causes the utility to provide a partial function to run fast scan of database integrity and collect pointer verification data. While the job is run, the database can remain fully accessible to users. The utility generates files that can be used as input for DEDB Pointer Checker of FPB to run in-depth pointer check and produce complete analysis reports. The FULLSTEP=NO option reduces online run time but must be run in multiple steps.

For more information about the FULLSTEP and TYPRUN options, see the topic "[Selecting the operating modes](#)" in the *IMS Fast Path Solution Pack IMS High Performance Fast Path Utilities User's Guide*.

Table 13. Sample members for IMS Fast Path Online Tools in the SHFPSAMP library

Sample member	Description	Type
FPXAPC1	Procedure to run the Online Pointer Checker utility or the Online Expert Reorganization utility with TYPRUN=RPT	PROC
FPXAPC2	Procedure to run the Online Pointer Checker utility or the Online Expert Reorganization utility with TYPRUN=FS	PROC
FPXAPC3	Procedure to run the Online Pointer Checker utility or the Online Expert Reorganization utility with TYPRUN=PTRALL	PROC

## Updating the required sample member in the SHPSSAMP library

Copy the required sample member from the SHPSSAMP library to your IMS PROCLIB data set or system PROCLIB data set and modify the member.

The SHPSSAMP library contains member FABLPGEN, which is a procedure for IMS Library Integrity Utilities to generate an LIU global option module. An instruction to modify the member is included in the member.

## Setting up Unified Management Server for IMS Administration Foundation

If you have installed IBM Unified Management Server for z/OS, you can configure and activate IMS Administration Foundation features, which provide a sub set of the features that have been provided by IBM Management Console for IMS and Db2 for z/OS.

### About this task

The IMS Administration Foundation features that are activated by IMS Tools Base and IMS Fast Path Solution Pack include viewing charts based on sensor data, database exceptions, reports, graphical view of database or program structures, and DBD and PSB source statements. The graphical user interface is provided by IBM Unified Experience for z/OS that runs as an application for Zowe virtual desktop.

The IBM Unified Management Server for z/OS provides a web service infrastructure and a unified user interface that consolidate information from IMS subsystems and Db2 subsystems on a sysplex.

At least one Unified Management Server server instance must be set up on each sysplex and on top of a Zowe infrastructure running on the sysplex.

### Procedure

1. For instructions for activating and configuring IMS Administration Foundation features for IBM Unified Management Server for z/OS, see the topic "Post-SMP/E installation for IMS Administration Foundation" in the *Unified Management Server User Guide*.
2. To use the IMS Administration Foundation features on the graphical user interface provided by IBM Unified Experience for z/OS, see the topic "Using IMS Administration Foundation" in the *Unified Management Server User Guide*.

## Setting up the Online Structure Change utility

Before you restructure a DEDB with the Online Structure Change utility, you must configure the environment.

The Online Structure Change utility requires that the PTFs of the following APARs are applied to IMS 15: PH00728, PH09142, PH16612, and PI83433

To use the Online Structure Change utility, IMS 15 is required. This utility cannot be used with IMS 14.

**Note:** The Online Structure Change utility uses the following three XCF groups:

- XCF group for XCF communications among IMS control regions, OSC driver job, and OSC internal apply job (xxxxxxA0).

The name of the XCF group is OSCXCF. You can change the XCF group name by creating a base configuration module.

- XCF group for the IMS Tools Online System Interface used in production IMS systems.

You specify the name of the XCF group while you configure the IMS Tools Online System Interface.

- XCF group for the IMS Tools Online System Interface used in IMS DBCTL system.

You specify the name of the XCF group while you configure the IMS Tools Online System Interface.

## Procedure

1. [“Creating a base configuration module” on page 45](#)
2. [“Configuring the OSC logger exit routine” on page 47](#)
3. [“Configuring the IMS DBCTL system” on page 49](#)
4. [“Configuring the internal reader facility” on page 50](#)
5. [“Configuring the Common Service Layer \(CSL\)” on page 51](#)
6. [“Configuring IMS Tools Online System Interface” on page 51](#)
7. [“Configuring IMS Tools Common Pauser” on page 52](#)

## Creating a base configuration module

The Online Structure Change utility reads a base configuration module, HFPSETOP or HFP#*imsid*. A base configuration module defines base configuration parameters, such as the user log record ID and XCF group name, used in Online Structure Change utility jobs. If you want to change the log record ID or XCF group name, create a base configuration module.

### About this task

To use the Online Structure Change utility in a single IMSplex, create one base configuration module, HFPSETOP. If you need a different set of base configuration parameters for each IMS system or IMSplex, you create multiple base configuration modules. If you want to store these modules in a single library, the member name of each module must begin with HFP# followed by *imsid*.

At run time, the Online Structure Change utility searches for the base configuration module in the library that the CONFIGLIB\_DSN keyword of the Online Structure Change driver job (OSC driver job) specifies. The utility searches for the configuration module in the following order and uses the first base configuration module that is found:

1. HFP#*imsid* (*imsid* is obtained from the IMSID keyword)
2. HFPSETOP

## Procedure

1. Create a HFPSETOP job.

The following figure shows an example of a job to create base configuration module HFPSETOP.

```

//HFPSETOP JOB CLASS=A,REGION=0M
//*
//MYLIBS1 JCLLIB ORDER=IMSDEV.PROCLIB
//*
//*=====*
//* BUILD OSC CONFIG MODULE *
//*=====*
//C EXEC PGM=ASMA90,
// PARM='LIST,RENT,NODECK'
//SYSPRINT DD SYSOUT=*
//SYSLIB DD DSN=SYS1.MACLIB,DISP=SHR
// DD DISP=SHR,DSN=HPFP.SHFPMAC0
//SYSUT1 DD SPACE=(CYL,(2,2)),UNIT=SYSALLDA
//SYSLIN DD DSN=&&OBJ,SPACE=(CYL,(1,1)),
// UNIT=SYSALLDA,DISP=(MOD,PASS),
// DCB=(BLKSIZE=3040,LRECL=80,RECFM=FB)
//SYSIN DD *
HFP3SET ULOGID=F1, +
XCFGROUP=XCF0SC1

//*
//L1 EXEC PGM=HEWL,PARM='XREF,LIST,RENT',COND=(4,LE,C)
//SYSPRINT DD SYSOUT=*
//SYSLMOD DD DISP=SHR,DSN=IMS.OSC.USERLIB
//SYSUT1 DD SPACE=(CYL,(5,2)),UNIT=SYSALLDA
//SYSLIN DD DSN=&&OBJ,DISP=(OLD,DELETE)
// DD *
NAME HFPSETOP(R)
//*

```

2. Review the base configuration parameters specified for the SYSIN DD statement and, if necessary, modify the parameters.

The following table summarizes the base configuration parameters.

Parameter	Description
ULOGID= <i>id</i>	Optional. Specifies the user log record ID which the utility uses to generate user log records. <i>id</i> is a 2-character hexadecimal value, A0 - FF.  Default: F1
XCFGROUP	Optional. Specifies a 1- to 8-character XCF group name. This group name is used for XCF communications among IMS control regions, OSC driver job, and OSC internal apply job (xxxxxxA0). <ul style="list-style-type: none"> <li>• This XCF group name must be different from the TOI XCFGROUP name that is used for IMS Tools Online System Interface.</li> <li>• The name must be unique within the sysplex.</li> <li>• The name must be the same in a single IMSplex.</li> </ul> Default: OSCXCF

3. Submit the HFPSETOP job to load, link-edit, and bind the HFPSETOP module.
4. Update the IMS control region job to include in the STEPLIB concatenation the executable load library that includes the HFPSETOP module.

## What to do next

Information about the base configuration module must be specified in the OSC driver job JCL.

- The executable load library that includes the HFPSETOP module must be added to the STEPLIB concatenation.
- The CONFIGLIB\_DSN keyword of the HFPSYSIN DD statement must specify the executable load library.

Make sure that this information is passed on to the database administrator who prepares the OSC driver job JCL.

## Configuring the OSC logger exit routine

To capture database updates made by applications while the Online Structure Change utility job is running, the OSC logger exit routine must be enabled and activated in the IMS control region.

### About this task

You can configure the OSC logger exit routine by using IMS Tools Generic Exits of IMS Tools Base or by using the IMS refreshable logger exit routine.

- [“Configuring the OSC logger exit routine by using IMS Tools Generic Exits” on page 47](#)
- [“Configuring the OSC logger exit routine by using the IMS refreshable logger exit routine” on page 48](#)

### Configuring the OSC logger exit routine by using IMS Tools Generic Exits

To configure the OSC logger exit routine by using IMS Tools Generic Exits of IMS Tools Base, you must install and configure the IMS Tools Generic Logger Exit interface, which allows multiple exit routines to be called during IMS logger execution.

### About this task

In this task, you will configure the environment for the Generic Logger exit routine that is provided by the Online Structure Change utility (HFPFLGX0).

The executable load libraries of IMS Tools Generic Exits and IMS High Performance Fast Path Utilities must be APF-authorized.

### Procedure

1. Create a unique GLXssid0 PROCLIB member for each IMS system in which you plan to use the Online Structure Change utility. *ssid* is the 4-character IMS subsystem identifier.

Add the following lines to each GLXssid0 member:

```
EXITDEF(TYPE(LOGR) EXITNAME(HFPFLGX0)
LOADLIB(your_SHFPLOAD))
```

Where *your\_SHFPLOAD* is the data set name of the SHFPLOAD library.

2. Update the IMS control region job to include in the STEPLIB concatenation the executable load libraries for IMS Tools Generic Exits and IMS High Performance Fast Path Utilities.
3. Start the IMS control region. The following messages are issued if the logger exit routine is activated successfully:

```
HFP01000I  LOGGER EXIT INITIALIZING
HFP01503I  JOINED XCF GROUP xxxxxxxx AS MEMBER yyyy
HFP01000I  LOGGER EXIT INITIALIZED
```

### What to do next

For detailed instructions on how to add GLXssid0 members, see the *IMS Tools Base IMS Tools Common Services User's Guide and Reference*.

### Important:

- In the //STEPLIB concatenations of all IMS control regions that share the same RECON data sets, IMS High Performance Fast Path Utilities must exist and they must be at the same maintenance level.
- To use the BMP, CICS, and ODBA application pause features of IMS Tools Common Pauser, you must also define the IMS Tools Common Pauser logger exit routine (FOIVFLG0). Add the following lines to each GLXssid0 member:

```
EXITDEF(TYPE(LOGR) EXITNAME(FOIVFLG0)  
LOADLIB(your_SFOILOAD))
```

where *your\_SFOILOAD* is the data set name of the SFOILOAD library.

- To run an Online Structure Change utility job and an IBM Security Guardium S-TAP for IMS on z/OS job simultaneously in an IMS environment, the following APARs must be applied:
  - APAR PH27204 to IBM IMS Fast Path Solution Pack for z/OS
  - APAR PH27744 to IBM Security Guardium S-TAP for IMS on z/OS
- To run an Online Structure Change utility job and an IMS Online Reorganization Facility job simultaneously in an IMS environment, APAR PH27204 must be applied to IBM IMS Fast Path Solution Pack for z/OS.

## Configuring the OSC logger exit routine by using the IMS refreshable logger exit routine

To configure the OSC logger exit routine by using the IMS refreshable logger exit routine, you must configure the Logger user exit (LOGWRT) routine provided by the Online Structure Change utility. The IMS refreshable logger exit routine allows multiple exit routines of the same type to be called in sequence.

### About this task

In this task, you will configure the environment for the Logger user exit routine (LOGWRT) provided by the Online Structure Change utility (HFPFLGX0).

The executable load library of IMS High Performance Fast Path Utilities must be APF-authorized.

### Procedure

1. Specify the following EXITDEF parameter in the USER\_EXITS section of the DFSDFxxx PROCLIB member.

```
EXITDEF=(TYPE=LOGWRT,EXITS=(HFPFLGX0))
```

2. Update the IMS control region job to include in the STEPLIB concatenation the executable load library for IMS High Performance Fast Path Utilities, SHFPLMD0.
3. Start the IMS control region. The following messages are issued if the logger exit routine is activated successfully:

```
HFP01000I  LOGGER EXIT INITIALIZING  
HFP01503I  JOINED XCF GROUP xxxxxxxx AS MEMBER yyyy  
HFP01000I  LOGGER EXIT INITIALIZED
```

### What to do next

For detailed instructions on how to add the user exit definitions, see the topic "[DFSDFxxx member of the IMS PROCLIB data set](#)" in *IMS System Definition*.

#### Important:

- In the //STEPLIB concatenations of all IMS control regions that share the same RECON data sets, IMS High Performance Fast Path Utilities must exist and they must be at the same maintenance level.
- To use the BMP, CICS, and ODBA application pause features of IMS Tools Common Pauser, you must also define the IMS Tools Common Pauser logger exit routine (FOIVFLG0). Add FOIVFLG0 in the EXITDEF parameter of the USER\_EXITS section of the DFSDFxxx member.

```
EXITDEF=(TYPE=LOGWRT,EXITS=(HFPFLGX0,FOIVFLG0))
```

- To run an Online Structure Change utility job and an IBM Security Guardium S-TAP for IMS on z/OS job simultaneously in an IMS environment, the following APARs must be applied:
  - APAR PH27204 to IBM IMS Fast Path Solution Pack for z/OS
  - APAR PH27744 to IBM Security Guardium S-TAP for IMS on z/OS
- To run an Online Structure Change utility job and an IMS Online Reorganization Facility job simultaneously in an IMS environment, APAR PH27204 and APAR PH40905 must be applied to IBM IMS Fast Path Solution Pack for z/OS.
- To run an Online Structure Change utility job and an OEM product job that uses the logger exit routine simultaneously in an IMS environment, APAR PH40905 must be applied to IBM IMS Fast Path Solution Pack for z/OS.

## Configuring the IMS DBCTL system

To apply all database updates captured during the Online Structure Change utility job, an IMS DBCTL system must be configured and started before the Online Structure Change utility job is submitted.

### About this task

- The IMS DBCTL system must be configured in a separate IMS production environment.
- The IMS DBCTL system must not be a member of the data sharing group that the target DEDB belongs to.
- The DEDB to restructure must be registered to the IMS DBCTL system. However, the DEDB should not be registered to the IMS DBCTL RECON data sets before the OSC job.

### Procedure

1. Specify the following parameters in the DFSPBxxx member of the IMS DBCTL PROCLIB data set:
  - IRLM=N,
  - IRLMNM=,
2. Specify the new ACB to the IMS DBCTL system.
  - If ACBLIB-managed ACBs are used: Specify the new ACB library to the IMS DBCTL system.
  - If IMS-managed ACBs are used: Ensure that the pending definitions for the production environment and the definitions that the IMS DBCTL system is currently using are the same.
3. Start the IMS DBCTL system.

Instead of starting the IMS DBCTL system, you can start the IMS DB/DC system.

If you want the Online Structure Change utility to check the integrity of database definitions, activate the Integrity Checker of IMS Library Integrity Utilities before starting the IMS DBCTL system. If the Integrity Checker utility is activated, the integrity of the following database definitions are checked:

- The new ACB specified for the OSC driver job and the ACB used in the DBCTL environment.
- The new randomizer specified for the OSC driver job and the randomizer that is used for the database in the DBCTL environment.
- The new segment edit/compression routine specified for the OSC driver job and the segment edit/compression routine that is used for the database in the DBCTL environment.

If you also want the Online Structure Change utility to stop processing when a database definition mismatch is found, specify CHECKON=(Y,D) in the global option module. For more information, see [“Activating Integrity Checker” on page 65](#) and [“JCL requirements for the FABLPGEN program” on page 76](#).

## Configuring the internal reader facility

For the Online Structure Change utility to submit OSC internal jobs, the internal reader facility must be configured.

### Procedure

1. Create the following procedure in the PROCLIB. The PROCLIB is the one that is specified in the MVS START command.

```
//          PROC MBR=IMSMMSG,CLASS=A
//IEFPROC EXEC PGM=IEBEDIT
//SYSPRINT DD DUMMY
//SYSUT1   DD DDNAME=IEFRDER
//SYSUT2   DD SYSOUT=(&CLASS,INTRDR),DCB=BLKSIZE=80
//SYSIN    DD DUMMY
//IEFRDER  DD DISP=SHR,
//          DSN=xxxxxxx(&MBR)
//
```

For DSN=xxxxxxx, specify the name of the OSC internal job data set. This value must match the value that the database administrator specifies for the JCLDSN keyword of the HFPSYSIN DD statement in the OSC driver job JCL.

2. Verify that the internal reader facility is configured correctly by completing the following steps:
  - a. Delete the OSC internal job data set. Refer to the following example:

```
//IDCAMS1 EXEC PGM=IDCAMS,COND=EVEN
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *,DCB=BLKSIZE=80
DELETE ( HPFP.JCLDSN ) NONVSAM
SET MAXCC = 0
/*
```

- b. Allocate the OSC internal job data set. Refer to the following example:

```
//ALLOCLIB EXEC PGM=IDCAMS,DYNAMNBR=400
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
ALLOCATE DSNAME('HPFP.JCLDSN') -
NEW      DSORG(PO)      UNIT(SYSDA) -
RECFM(F B) LRECL(80)   BLKSIZE(800) -
CYLINDERS SPACE(10,05) DIR(50)  DSNTYPE(LIBRARY)
/*
```

DCB attributes must be LRECL=80 and BLKSIZE=800.

If multiple OSC driver jobs use the same OSC internal job data set, the data set must be a PDSE.

- c. Create member OSCTEST in the OSC internal job data set. Refer to the following example:

```
//STEP1    EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSIN    DD DUMMY
//SYSUT2   DD DISP=SHR,DSN=HPFP.JCLDSN(OSCTEST)
//SYSUT1   DD DATA,DLM=$#
//OSCTEST  JOB CLASS=A,MSGLEVEL=(1,1),
//          USER=,PASSWORD=
//
//*
//OSCDUMMY EXEC PGM=IEFBR14
//SYSPRINT DD SYSOUT=A
//
//*
$#
//
```

3. Issue the S OSCINTRD,MBR=OSCTEST command to submit the OSCTEST job. Ensure that the OSCTEST job completes without errors.

**Tip:** To learn more about the internal reader facility, see the topic "[Using the internal reader facility](#)" in *z/OS JES Application Programming*.



## What to do next

Information about the internal reader facility must be specified in the OSC driver job JCL.

- The member name of the procedure for the internal reader facility must be specified on the INTRDR keyword of the HFPSYSIN DD statement.
- The name of the OSC internal job data set must be specified on the JCLDSN keyword of the HFPSYSIN DD statement.

Make sure that required information is passed on to the database administrator who prepares the OSC driver job JCL.

## Configuring the Common Service Layer (CSL)

The Online Structure Change utility uses the single point of control (SPOC) program. To enable SPOC, you must configure the IMSplex with CSL.

### Procedure

Follow the instructions in the topic "[Configuring an IMSplex with CSL](#)" in *IMS System Administration*.

## Configuring IMS Tools Online System Interface

The Online Structure Change utility uses IMS Tools Online System Interface (TOSI) of IMS Tools Base to issue IMS commands.

### Procedure

**Important:** You must configure IMS Tools Online System Interface on both the production IMS systems and the IMS DBCTL systems.

1. Create a unique FOIssidP member for each IMS system that the Online Structure Change utility communicates through IMS Tools Online System Interface.

*ssid* is the 4-character IMS system identifier.

In the FOIssidP members, specify the 1- to 5- character string used for the XCFGROUP name. This XCFGROUP string is later prefixed with "TOI" to create the complete XCF group name.

2. Create a unique GPRssid0 member for each IMS system that the Online Structure Change utility communicates through IMS Tools Online System Interface.

*ssid* is the 4-character IMS system identifier.

In the GRPssid0 members, specify the EXITDEF parameter.

For more information about adding a GPRssid0 member, see the topic "[Generic Partner exit definitions](#)" in the *IMS Tools Base IMS Tools Common Services User's Guide and Reference*.

3. Update the IMS control region job to include in the STEPLIB concatenation the executable load libraries for IMS Tools Generic Exits and IMS Tools Online System Interface.
4. Start the IMS control region.

Locate the following TOSI message to ensure that IMS Tools Online System Interface is configured correctly.

```
FOI100I TOOLS ONLINE INTERFACE ENABLED, XCF GROUP=xxxxx, CMD Security=xxx
```

## What to do next

XCFGROUP names must be specified in the OSC driver job JCL.

- The XCFGROUP string for the production IMS systems must be specified on the TOIXCFGRP keyword of the HFPSYSIN DD statement.

- The XCFGROUP string for the IMS DBCTL system must be specified on the TOIXCFGRP\_APPLY keyword of the HFPSYSIN DD statement.

Make sure that required information is passed on to the database administrator who prepares the OSC driver job JCL.

## Configuring IMS Tools Common Pauser

The Online Structure Change utility uses IMS Tools Common Pauser to enable the BMP pause feature, which suspends BMP applications that access the database to which you want to make changes, and the CICS and ODBA application pause feature, which suspends CICS and ODBA applications that access the database to which you want to make changes.

### Before you begin

You must apply the following APARs and configure IMS Tools Common Pauser:

- APAR PH48696 for IBM IMS Fast Path Solution Pack for z/OS
- APAR PH48392 for IBM IMS Tools Base for z/OS 1.7

### Procedure

Follow the instructions in the topic "[Configuring IMS Tools Common Pauser](#)" in the *IMS Tools Base Configuration Guide*.

**Important:** If you do not want specific applications to be paused, do not specify the library that contains the IMS Tools Common Pauser load modules in the STEPLIB of the job.

## Setting up the Integrity Checker utility of IMS Library Integrity Utilities

---

The Integrity Checker utility of IMS Library Integrity Utilities prevents accidental misuse of ACBs or DBDs in your production environment. If you want to use the Integrity Checker utility, you must configure the utility.

### Before you begin

Before you set up the Integrity Checker utility, see the topic "[Integrity Checker overview](#)" in the *IMS Library Integrity Utilities User's Guide* and learn how the utility prevents database corruptions and how it works.

## Planning for Integrity Checker configuration

Before you activate the DMB verification function of Integrity Checker, you must understand the resources used by Integrity Checker and design the most suitable Integrity Checker configuration for your IMS environment.

After you design your Integrity Checker configuration, activate Integrity Checker by completing the instructions in "[Activating Integrity Checker](#)" on page 65.

Use the following topics to design the Integrity Checker configuration:

- "[LIU load module library customization](#)" on page 53
- "[LICON data sets and global option modules](#)" on page 54
- "[Integrity Checker configuration requirements](#)" on page 54
- "[Runtime options and environments](#)" on page 60
- "[Historical data maintained in LICON data sets](#)" on page 61
- "[Considerations for activating Integrity Checker](#)" on page 63

## LIU load module library customization

The IMS Library Integrity Utilities load module library (also referred to as LIU load module library) must be customized to use Integrity Checker.

The DMB verification function of Integrity Checker is triggered by IMS jobs (IMS online, application, IMS standard utility, and IMS Tools utility jobs) that access databases. Therefore, unlike other IMS Tools programs that run with JCL in which the EXEC PGM= parameter specifies the utility program name to execute, Integrity Checker must be customized to automatically start DMB verification when a database is accessed.

The DMB verification process runs as part of the DBRC authorization process. Therefore, instead of coding JCL statements, you must customize the LIU load module data set (SHPSLMD0 data set) to work with DBRC module DSPCRTR0.

**Important:** In IMS Library Integrity Utilities 2.1 and earlier, alias name DSPCRTR0 was assigned for the FABLRTR0 module by default, but in IMS Library Integrity Utilities 2.2 and later, the alias name is not assigned. You must customize the LIU load module library.

### Methods for customizing the LIU load module library

Integrity Checker supports two methods for customizing the LIU load module data set. Compare the two methods and determine the best method for your environment.

#### Method 1: Defining alias name DSPCRTR0 for FABLRTR0 (recommended method)

Module FABLRTR0 is the program load module that is stored in the LIU load module library. Module DSPCRTR0 is the DBRC router module, which is one of the DBRC authorization modules.

If alias name DSPCRTR0 is defined for the FABLRTR0 module, and the LIU load module library precedes the IMS resident library (SDFSRESL data set) in the STEPLIB DD in JCL and procedures of IMS jobs, when a database is accessed by such jobs, instead of the DBRC module DSPCRTR0, the FABLRTR0 module starts and activates DMB verification. To apply this method, the LIU load module library must be APF-authorized.

- Advantage: You can use the standard SMP/E methods to apply program temporary fixes (PTFs) for both IMS Library Integrity Utilities and IMS.
- Disadvantage: You must modify the STEPLIB DD statement in JCL and procedures of all IMS jobs that access databases.

#### Method 2: Merging Integrity Checker load modules into the IMS resident library (SDFSRESL)

If all the Integrity Checker modules (FABL\* members) in the LIU load module library are merged into the IMS SDFSRESL data set, when a database is accessed, the FABLRTR0 module, which is link-edited to the DBRC module DSPCRTR0 module, starts and activates DMB verification. Before the modules are merged, the FABLRTR0 module and DBRC module DSPCRTR0 must be link-edited to create one DSPCRTR0 module, and the module entry point must be set to FABLRTR0. Before the modules are merged, a backup of the IMS SDFSRESL data set must be created.

- Advantage: You do not need to modify the STEPLIB DD statement in each JCL and procedure of IMS jobs that access databases.
- Disadvantage: When you apply PTFs for IMS Library Integrity Utilities and IMS, the following additional steps are required:
  - For IMS Library Integrity Utilities, after you apply a PTF, you must merge the members again.
  - For IMS, if the PTF updates the DSPCRTR0 module, you must restore the DSPCRTR0 module before you apply the PTF. After you apply the PTF, create a backup of the SDFSRESL data set, and then link-edit FABLRTR0 and DSPCRTR0 again.

Integrity Checker supports multiple versions of IMS with one module. Therefore, with either method, if the version of IMS is supported by IMS Library Integrity Utilities, the same LIU load module data set can be used.

## LICON data sets and global option modules

LICON data sets and global option modules are unique resources that are required by Integrity Checker.

### LICON data sets

*LIU Integrity control data sets* (LICON data sets) are KSDS data sets that are the repositories for *registered DMB entries* (RDEs). RDEs contain database management block (DMB) information that is used in DMB verification. In the LICON data sets, RDEs are stored as KSDS records. At least one LICON data set must be defined and initialized.

Integrity Checker obtains the DMB information that IMS used to load the database, stores the information in the RDE as the correct DMB information, and refers to that DMB information to verify the DMB information obtained from the DBDLIB, ACBLIB, or IMS directory that is referenced by IMS jobs.

In addition to the DMB information, RDEs contain the following information:

- Runtime options that are applied to DMB verification.
- Time stamp of the last database access made by load utility programs, unload utility programs, and utilities or application programs with an update intent in the PSB.

When a DBD is updated, Integrity Checker updates the corresponding RDE accordingly.

In addition to the RDE that contains the latest DMB information, Integrity Checker also maintains historical copies of RDEs. You can use those copies to review the DBD information before a DBD change, or when you restore DBDs, you can use the copies to restore RDEs.

### Global option modules

Global option modules are the configuration definition modules of Integrity Checker. Each global option module defines the LICON data set and the runtime options that are applied to DMB verification. IMS Library Integrity Checker does not provide global option modules, so you must create at least one global option module.

IMS Library Integrity Utilities provides the FABLPGEN program for creating global option modules. The LICON data set name and runtime options are defined through FABLPGIN macro control statements of the FABLPGEN program.

After running the FABLPGEN program, the source code must be assembled and link-edited to a load module. The created global option module must be stored in the LIU load module library.

### Integrity Checker configuration requirements

Because DMB verification works within DBRC authorization processing, DBRC must be active in your IMS environment. The number of LICON data sets and global option modules in an Integrity Checker configuration depends on how the DBRC environment is configured.

The basic rules for designing an Integrity Checker configuration are as follows:

- One LICON data set must be created for each set of RECON data sets. (A set consists of RECON1, RECON2, and RECON3.)
- Global option modules contain the names of the LICON data sets. Therefore, if your environment requires multiple LICON data sets, you must prepare the same number of global option modules.
- Global option modules must be named using the following naming convention:

#### **LIU@INST**

The default name for the global option module. If your environment requires only one LICON data set, use this name.

#### **LIU@*imsid***

If your environment requires multiple LICON data sets, use this format. For *imsid*, use the IMS ID of each IMS subsystem.

When multiple global option modules exist, Integrity Checker determines the global option module to use from the IMS ID. If no corresponding global option module is found for an IMS ID, Integrity Checker uses the default module LIU@INST. Even if the corresponding global option module is found, if some options are not defined in that module, the options that are defined in LIU@INST are applied. If LIU@INST is not found or some options are not defined in the LIU@INST, the system default values are used.

**Tip:** At sign (@) is a code-page-dependent character. If you are working in an environment where you cannot use the at sign (@), name the modules LIUGINST or LIUGimsid.

Use the following examples to design an Integrity Checker configuration for your environment.

- [“Single IMS subsystem configuration example” on page 55](#)
- [“Multiple IMS subsystems configuration example: Data-sharing environment” on page 56](#)
- [“Multiple IMS subsystems configuration example: Non-data-sharing environment” on page 57](#)
- [“Multiple IMS subsystems configuration example: Multiple data-sharing environments” on page 58](#)
- [“Multiple IMS subsystems configuration example: XRF complex” on page 59](#)

As a rule, the same runtime options must be defined for each LICON data set. To simplify the explanations, these examples are cases where one global option module refers to one LICON data set.

**Tip:** Certain runtime options can have different values within one LICON data set. To define different runtime option values, instead of assigning alias names for global option modules as shown in the examples, create one global option module for each IMS ID. For more information about the runtime options, see [“Global option module generation macro” on page 75](#).

For IMS environments that are not explained in these examples, such as IMSplex, the basic rules are the same. For any IMS environment, you can follow these basic rules to design Integrity Checker configuration:

- One LICON data set for one set of RECON data sets
- One global option module for one LICON data set

### **Single IMS subsystem configuration example**

The following figure shows the simplest configuration.

In this environment, one IMS subsystem is used and one set of RECON data sets is used, so the Integrity Checker resources that are required in this environment are as follows:

- Number of LICON data sets: 1
- Number of global option modules: 1

Because only one global option module is required, the name of the global option module is LIU@INST.

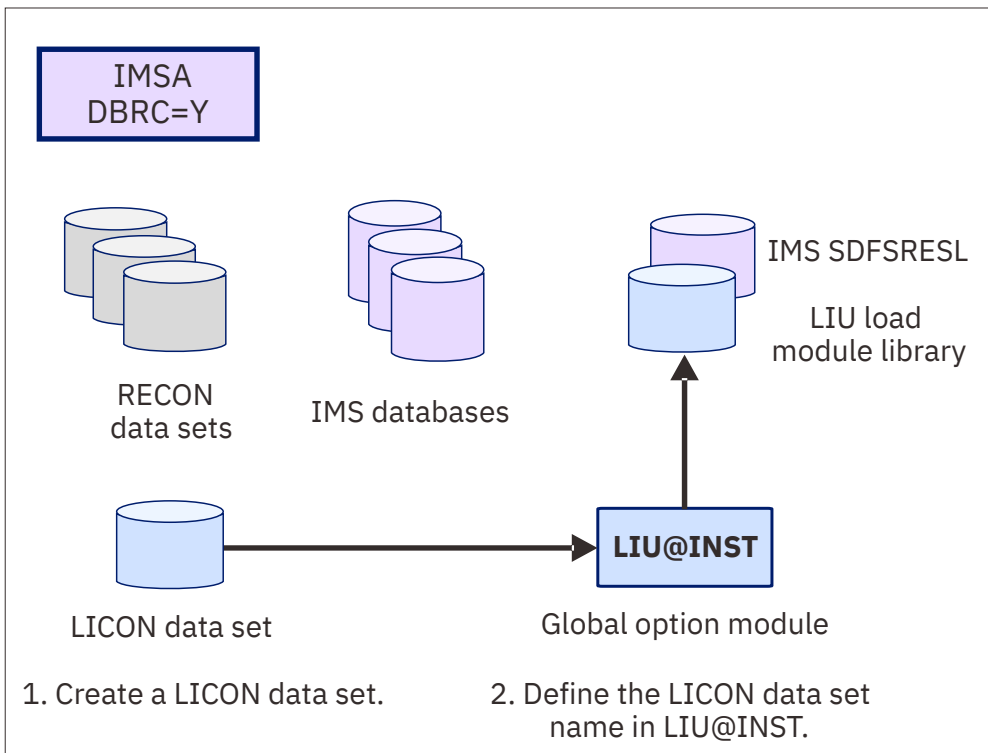


Figure 3. Integrity Checker configuration for a single IMS subsystem

### Multiple IMS subsystems configuration example: Data-sharing environment

The following figure illustrates a configuration where two IMS subsystems share databases.

In this environment, two IMS subsystems are used and one set of RECON data sets is used, so the Integrity Checker resources that are required in this environment are as follows:

- Number of LICON data sets: 1
- Number of global option modules: 1

Because only one global option module is required, the name of the global option module is LIU@INST.

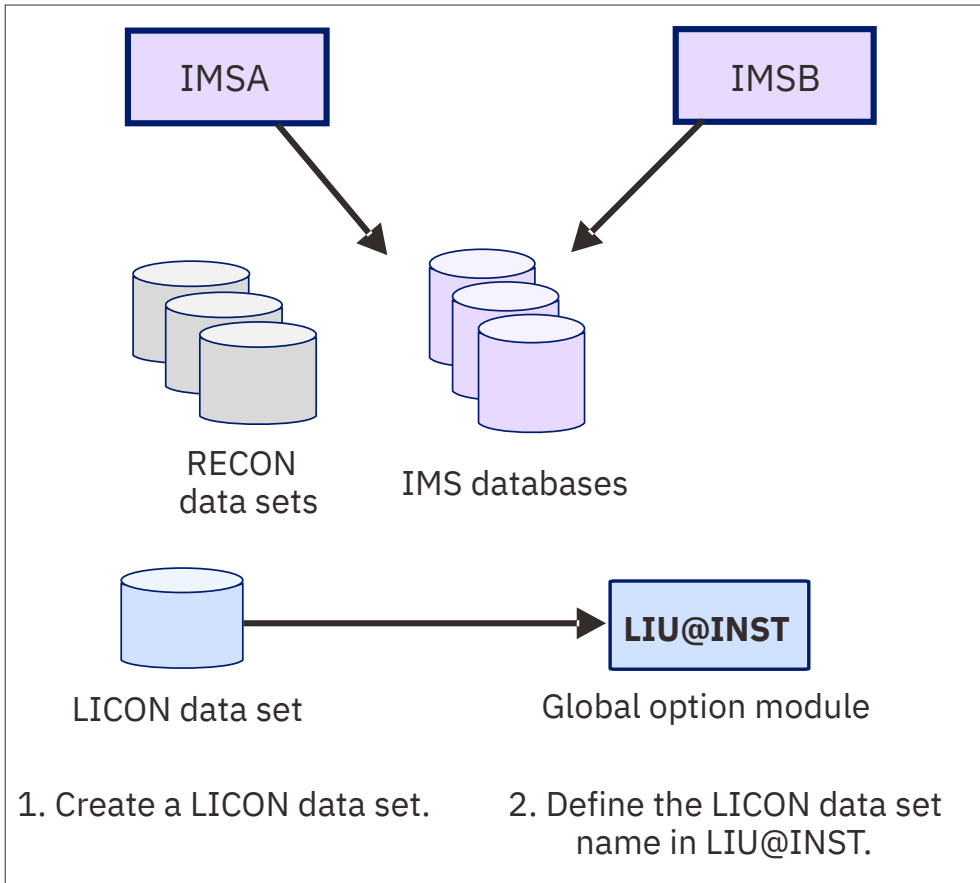


Figure 4. Integrity Checker configuration in a data-sharing environment

### Multiple IMS subsystems configuration example: Non-data-sharing environment

The following figure illustrates a configuration where two IMS subsystems use a different set of databases. In such an environment, a LICON data set must be created for each IMS subsystem. Each LICON data set requires one global option module.

In this environment, two IMS subsystems are used and two sets of RECON data sets are used, so the Integrity Checker resources that are required in this environment are as follows:

- Number of LICON data sets: 2
- Number of global option modules: 2

Because two global option modules are required, the names of the global option modules are LIU@IMSA for IMS subsystem IMSA, and LIU@IMST for IMS subsystem IMST.

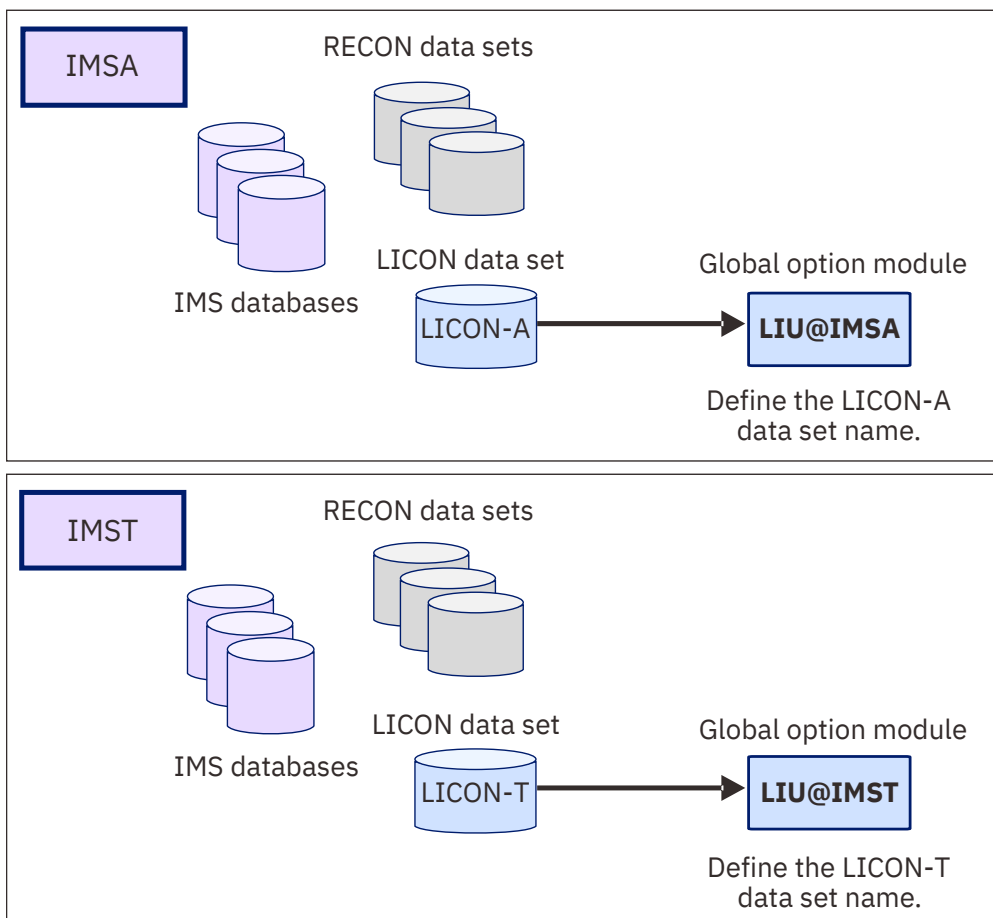


Figure 5. Integrity Checker configuration in a non-data-sharing environment

### Multiple IMS subsystems configuration example: Multiple data-sharing environments

The following figure illustrates a configuration for multiple data-sharing environments. In each data-sharing environment, two IMS subsystems use the same set of databases. In such environments, a LICON data set must be created for each data-sharing environment.

Generally, when four IMS subsystems exist, four global option modules are required. However, as shown in the figure, if you create a global option module for each LICON data set and define an alias name for each global option module, you can design the Integrity checker configuration with two global option modules.

Create global option module LIU@IMSA for IMS subsystem IMSA, and then define alias name LIU@IMSB for LIU@IMSA so that IMS subsystem IMSB can also use LIU@IMSA. Do the same for IMS subsystems IMSC and IMSD.

**Tip:** If you create two global option modules (LIU@IMSA and LIU@IMSB), the LICON data set names and the runtime options must be the same between the two global option modules. By assigning an alias name and sharing a global option module, the same values are automatically applied; you can prevent errors that might be caused by inconsistency.



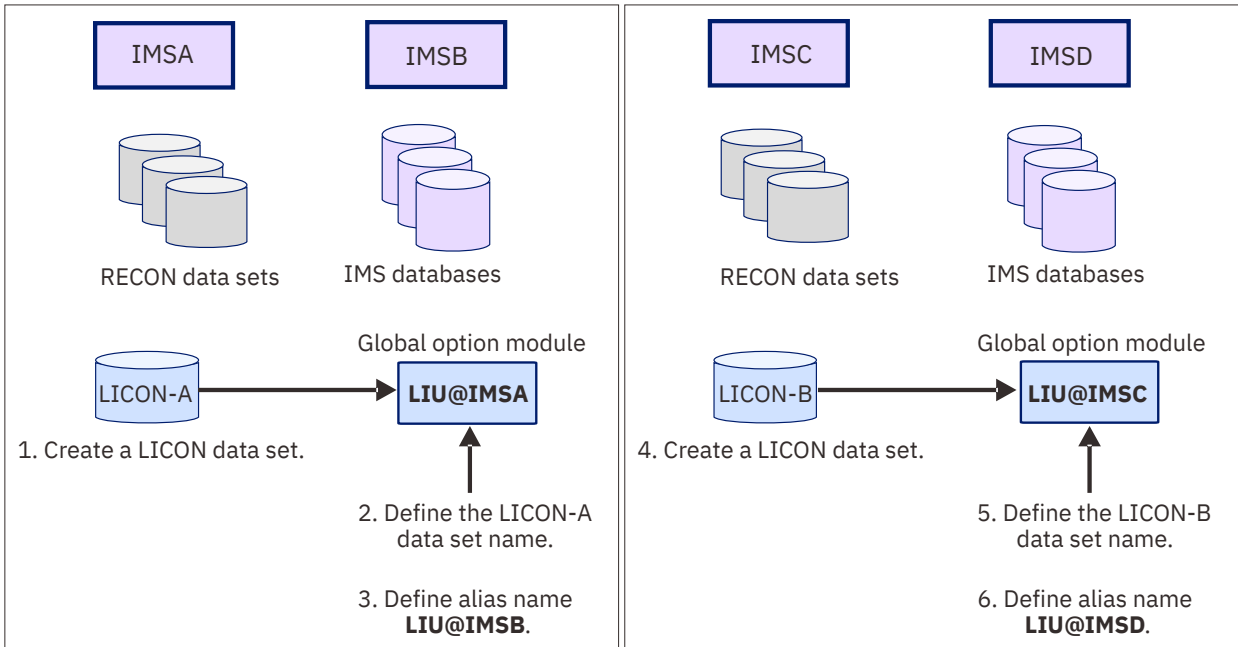


Figure 6. Integrity Checker configuration in multiple data-sharing environments

### Multiple IMS subsystems configuration example: XRF complex

To use Integrity Checker in an XRF complex, the active IMS subsystems and the alternate IMS subsystems must use the same LICON data set. If they use different LICON data sets, the change log of the DMB is not inherited during takeover, and Integrity Checker might not detect the DMB inconsistency or might deny DBRC authorization even though the correct DBDLIB or ACBLIB is used.

If the number of active IMS subsystems is one, the number of required LICON data set is also one. The name of the global option module is LIU@INST.

If multiple active IMS subsystems exist, define a LICON data set for each set of RECON data sets, and create one global option module for each LICON data set.

For example, in an XRF complex shown in the following figure, create a global option module for each active IMS subsystem. Create LIU@IMS1 and LIU@IMS3, and then assign alias name LIU@IMS4 for LIU@IMS3.

Then, to apply the same runtime options to the active IMS subsystems and the alternate IMS subsystems, assign alias to the global option modules so that the alternate IMS subsystems can also use the same global option modules.

Specifically, IMS subsystems IMS1 and IMS2 are in a same XRF complex, so the two subsystems must use the same LICON data set. Therefore, assign alias name LIU@IMS2 for LIU@IMS1. IMS subsystems IMS5 and IMS6 are alternate IMS subsystems for IMS3 and IMS4, so all these subsystems must use the same LICON data set. Therefore, assign alias names LIU@IMS5 and LIU@IMS6 for LIU@IMS3.

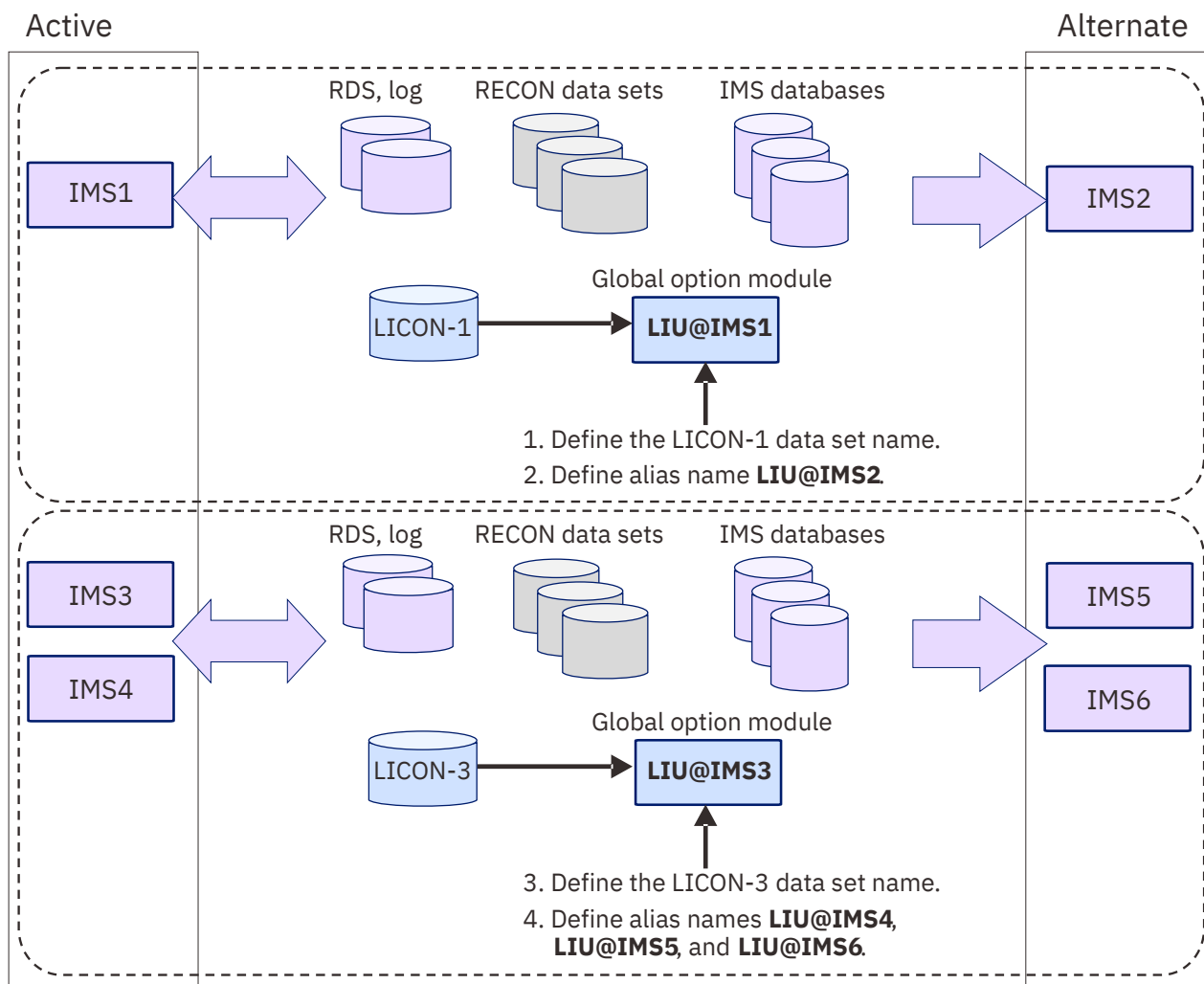


Figure 7. Integrity Checker configuration in an XRF complex

## Runtime options and environments

RDEs contain runtime options for DMB verification. Some runtime options can be defined differently for each IMS processing environment.

### How the runtime options are specified

The runtime options are commonly used across the environment that uses the global option module. The global default values that are applied to the options when creating new RDEs can be specified for each database.

The runtime options are defined in the global option module. You can specify the following runtime options:

- The data set name of the LICON data set
- DMB verification method (single-step or double-step)
- Routing codes and descriptor codes of Integrity Checker messages
- Option values to control the processing of Integrity Checker
- Global default values for the options used in creating new RDEs:
  - DMB verification option
  - Database access record option

- Number of expired RDEs to maintain

You specify the option values in the global option module by using the global option module generation macro. The option values that you specify are copied to the RDE when an RDE is created.

Generally, you can use the option values without changing them, but by using the LICON utility, you can change the option values in RDEs after they are created. By changing the values, you can apply different options for each database. For more information about these options, see [“Global option module generation macro” on page 75](#).

## How the runtime options are applied

Some runtime options can be set differently for each environment that Integrity Checker operates. Such options are referred to as *DMB verification options*.

DMB verification options control the processing and the action taken when a DMB mismatch is found. You can specify the options for each of the following IMS processing environments:

- Online IMS subsystem
- Batch program
- User load program
- Batch image copy utility
- Database recovery utility

For each environment, you can specify:

- Whether to activate DMB verification.
- Whether DMB verification sets a nonzero return code for the database authorization request to deny it, or only issues a warning message and registers the DMB to the LICON data set.

Using these options, you can control the behavior of DMB verification differently in each environment.

**Recommendation:** In all environments, set the option to deny the database authorization request when a DMB mismatch is found. By setting this option, you can prevent database corruption when an incorrect DBDLIB or ACBLIB is used.



**Attention:** Use the option *Only issue a warning message and register the DMB to the LICON data set* with caution. Use this option only when you intend to change the DBD, and you want the updated DBD reflected in the RDE so that the new DMB information is used in future DMB verifications. When this option is used, database corruption caused by use of an incorrect DBDLIB or ACBLIB cannot be prevented.

For example, if you want to use the DBD that is specified by a user load program for future DMB verifications, but you want to restrict DBD changes in other environments, you can have Integrity Checker issue a warning message and update the RDE in the user load program jobs, but deny database authorization when a DMB mismatch is found in other environments.

## Historical data maintained in LICON data sets

Integrity Checker stores historical copies of RDEs in the LICON data sets. RDEs record database access logs for database update, load, and unload applications.

## Historical copies of DBD definition

Integrity Checker maintains historical copies of RDEs. Each of these copies contains a part of the database description (DBD) that is used in DMB verifications. Whenever a DBD is changed, Integrity Checker creates a new RDE that contains the latest DMB information. The historical copies of RDEs can be used to track the changes made to DBDs.

The content of the current RDE and historical copies of RDEs can be printed in reports. You can use the reports to examine the information in DBDs, review the changes made to DBDs, or to compare the difference between the current DBD and the DBDs used in the past.

To print the content of an RDE in a report, use the LIST.DB command of the LICON utility. For more information, see the following topics:

- To print a report, see the topic "[LIST.DB command](#)" in the *IMS Library Integrity Utilities User's Guide*.
- For report field descriptions, see the topic "[Output from Integrity Checker](#)" in the *IMS Library Integrity Utilities User's Guide*.

## Database access recording option

Integrity Checker records the time stamp of the last database access that is made by update, load, and unload applications in the RDE together with the IMS subsystem name. Such information can be printed in a report, which can be used as evidence in database auditing.

To record database accesses, make the specifications in the RDE by using the global option module or the LICON utility. To use the database access recording option, specify the option for each of the following database access types:

Database access	Access type identified by Integrity Checker
Load utility	Load access
Reorganization utility	Load access
Unload utility	Unload access
Recovery utility	Update access
Utility or application program with the PCB processing option (PROCOPT) of A, I, R, or D	Update access

For instructions to specify these options, see the following topics:

- To set the options in the global option module, see "[Global option module generation macro](#)" on page 75.
- To update the options in RDEs, see the topic "[INIT.DB command](#)" in the *IMS Library Integrity Utilities User's Guide*.

When Integrity Checker is activated in an IMS online environment, Integrity Checker records access information only for the first database authorization request, and the recorded time is not updated while the IMS online environment is active. To have the recorded information updated while the IMS online environment is active, the ACCESS parameter of the DATABASE macro statement must specify UP or EX (during the system definition stage), or the parameter for the /START DB ACCESS= command must specify UP or EX.

**Restrictions:** The database access recording option can be used for the utilities or the application programs that are supported by Integrity Checker. However, the following restrictions apply:

- This option is not effective for online reorganization functions or online reorganization utilities that are provided by IMS or IMS Tools.
- For a database access through the High-Speed DEDB Direct Reorganization utility, Integrity Checker identifies the database access type as a database update.
- Database access for load or unload operations is recorded only when the operations are done by IMS standard utilities or IMS Tools utilities.
- If a utility or an application program ends with an error after the Integrity Checker DMB verification process ends successfully, the database access information that is recorded in the RDE is updated in the same way as when the utility or the application program ended successfully, even though the utility or application program ended with an error.
- For index databases or secondary index databases that have no PCBs, Integrity Checker does not record database access information in the RDEs except when the database operation is done by IMS Database Reorganization Expert.

## Considerations for activating Integrity Checker

Before you activate Integrity Checker, review these considerations.

### Cases where DMB verification is not done

DMB verification is not done in certain environments or for certain application jobs.

For more information, see the topic "[Restrictions: Cases where DMB verification is not done](#)" in the *IMS Library Integrity Utilities User's Guide*.

### Size of the LICON data sets

Before creating LICON data sets, you can estimate the required storage for the LICON data sets.

For more information, see "[Estimating the size of the LICON data set](#)" on page 63.

### LICON data set serialization consideration

If you want more than one MVS system to access the LICON data set, you must serialize the LICON data set. To access the LICON data set from more than one MVS system, Global Resource Serialization (GRS) or a similar global enqueue product must be installed.

For more information, see "[Serializing the LICON data set](#)" on page 68.

### RACF security considerations

If you want to protect the LICON data sets with RACF or if you plan to use Integrity Checker in IMS Database Recovery Facility jobs, you must modify RACF security.

For more information, see "[Setting up RACF security](#)" on page 68.

### Considerations when you alter the definition of an online HALDB or an online DEDB

When you alter the definition of an online HALDB database or an online DEDB database with the following IMS command or IMS utility, you must temporarily stop the DMB verification process.

- Use the INITIATE OLREORG command (with the ALTER option) and the online change (OLC) function to alter the definition of an online HALDB database.
- Use the DEDB Alter utility (DBFUDA00) to alter the definition of an online DEDB database.

After you alter the definition, restart the DMB verification process with new RDEs. Without these steps, the DMB verification process uses the old definitions to verify the DMBs. Therefore, the DMB verification process might deny database authorization requests that use correct IMS control blocks.

For detailed instructions, see the following topics in the *IMS Library Integrity Utilities User's Guide*:

- "Altering the definition of a DMB verification-enabled online HALDB by using the HALDB alter function"
- "Altering the definition of a DMB verification-enabled online DEDB by using the DEDB Alter utility (DBFUDA00)"

### Consideration when you change the maximum size of OSAM data sets for a HALDB

When you change the maximum size of OSAM data sets for a HALDB from 4 GB to 8 GB or 8 GB to 4 GB, you must use the LICON utility and manually create RDEs to reflect the change for the DMB verification process.

For more information, see the topic "[Changing the maximum OSAM data set size for a DMB verification-enabled HALDB](#)" in the *IMS Library Integrity Utilities User's Guide*.

## Estimating the size of the LICON data set

Before you create LICON data sets, you can estimate the required storage for the LICON data sets.

### About this task

Two methods are available for estimating the LICON data set size. The first method is more complicated but results in a precise data set size. The other method is simpler, but results in only an approximate data set size. You can use the simpler estimation method if the number of database segments is less than 20.

### Tips:

- To accommodate any future increase in the number of databases, partitions, or DEDB areas, make the LICON data set size larger than the value that you calculate. For example, when you allocate a LICON data set, increase the calculated primary allocation size by 10% to 20%, and increase the secondary allocation size by approximately 10% of the primary allocation size.
- When you create multiple LICON data sets, you can create them on the same volume or on different volumes.

## Procedure

For each LICON data set, use one of the following methods to estimate the data set size:

### Estimating the precise LICON data set size

Use the following formula to calculate the precise LICON data set size:

$$\text{LICON data set size} = \text{total\_size\_required\_for\_full-function\_databases} \\ + \text{total\_size\_required\_for\_HALDBs} \\ + \text{total\_size\_required\_for\_DEDBs}$$

#### **total\_size\_required\_for\_full-function\_databases**

The total size of all the full-function databases that are to be processed.

For each full-function database, calculate the required size by using the following formula:

$$(450 + 32 * \text{number\_of\_DSGs} + 52 * \text{number\_of\_segments} \\ + 180 * \text{access\_info\_size}) * 16$$

**Note:** DSG stands for data set group.

#### **total\_size\_required\_for\_HALDBs**

The total size of all the HALDB partitions that are to be processed.

For each HALDB partition, calculate the required size by using the following formula:

$$(450 + 32 * \text{number\_of\_DSGs} + 52 * \text{number\_of\_segments} \\ + 180 * \text{access\_info\_size}) * 16$$

#### **total\_size\_required\_for\_DEDBs**

The total size of all the DEDB areas that are to be processed.

For each DEDB area, calculate the required size by using the following formula:

$$(220 + 48 * \text{number\_of\_segments} + 180 * \text{access\_info\_size}) * 16$$

### Notes:

- If you do not enable the database access recording option (activated by the RECUPD, RECLD, or RECUL keyword in the global option module), *access\_info\_size* is 0. When this option is enabled, *access\_info\_size* increases by 1 for each keyword that you specify. For example, if you enable the RECUPD option (one keyword), *access\_info\_size* is 1. If you enable RECUPD and RECLD options (two keywords), *access\_info\_size* is 2.

**Related reading:** For instructions to activate this option, see [“Global option module generation macro” on page 75](#).

- For these formulas, the units are in bytes.
- Each formula is multiplied by 16 for storing histories of database definitions.

### Estimating the approximate LICON data set size

Use the following formula to calculate the approximate LICON data set size:

$$\text{LICON data set size} = (32 * \text{number\_of\_full-function\_databases} \\ + 32 * \text{number\_of\_HALDB\_partitions} \\ + 16 * \text{number\_of\_DEDB\_areas}) \text{ KB}$$

***number\_of\_full-function\_databases***

The number of full-function databases (excluding HALDBs) that are to be processed.

***number\_of\_HALDB\_partitions***

The number of HALDB partitions that are to be processed.

***number\_of\_DEDB\_areas***

The number of DEDB areas that are to be processed.

## Activating Integrity Checker

Activating Integrity Checker involves preparing the global option modules, LICON data sets, and LIU load modules, and other steps.

### Before you begin

Before you activate Integrity Checker, plan an Integrity Checker configuration for your environment, as described in [“Planning for Integrity Checker configuration”](#) on page 52.

### About this task

To activate Integrity Checker, you first prepare the global option modules and the LICON data sets. Then, by using the DBD library, ACB library, or IMS directory, register the DMB information for your databases in the LICON data set. When this registration is done, customize the LIU load modules by using either of the following methods:

- Create an alias of the DSPCRTR0 module and add DD statements to JCL or procedures of DBRC, IMS batch application, IMS utility, and IMS Tools (recommended method).
- Merge load modules into the IMS SDFSRESL library.

Finally, activate Integrity Checker by restarting IMS online and running IMS batch applications, IMS utilities, and IMS Tools jobs.

In both IMS batch and online environments, the steps to activate Integrity Checker are the same. These steps can be applied when you reactivate Integrity Checker after Integrity Checker is deactivated.

### Procedure

To activate Integrity Checker, complete the following steps:

- a. [“Setting up the global option modules”](#) on page 65
- b. [“Setting up the LICON data sets”](#) on page 66
- c. [“Setting up RACF security”](#) on page 68
- d. [“Customizing LIU load modules”](#) on page 70
- e. [“Configuring for a BPE-based DBRC environment”](#) on page 74
- f. [“Verifying that Integrity Checker is activated”](#) on page 74
- g. [“Restarting IMS online and running IMS batch application, IMS utility, and IMS Tools jobs”](#) on page 75

## Setting up the global option modules

Create global option modules and, optionally, assign alias names to the global option modules. At least one global option module must be present when Integrity Checker is started because Integrity Checker uses it to obtain the name of the LICON data set that it uses.

### Before you begin

See [“Integrity Checker configuration requirements”](#) on page 54 and determine the number of global option modules to create. Also, determine whether to share a global option module across multiple IMS subsystems.

## Procedure

1. Create global option modules.

To create global option modules, use the FABLPGEN procedure and provide the control statements by using the SYSIN input stream. The FABLPGEN procedure is in the SHPSSAMP data set. For an instruction, see [“Global option module generation macro” on page 75](#).

**Tip:** To avoid activating Integrity Checker until all of your installation activities are complete, have no global option modules created.

**Related reading:** The topic [“Options applied to RDEs when multiple global option modules exist with different effective ranges”](#) in the *IMS Library Integrity Utilities User's Guide*.

2. If you want more than one IMS subsystems to use a set of options that are defined in a single global option module, use the linkage editor to assign an alias name to the global option module.

In a database sharing environment where multiple IMS subsystems share databases, the LICON data set and option values that are defined in the global option module must be the same across the IMS subsystems. Assigning aliases is beneficial in such an environment as well as in XRF environments.

Use the following job to assign an alias name to the global option module.

```
//LKED JOB
//L EXEC PGM=IEWL,PARM='XREF,LIST'
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD UNIT=(SYSDA,SEP=(SYSLMOD,SYSLIN)),
// SPACE=(1024,(100,10),RLSE),DISP=(,DELETE)
//SYSLMOD DD DISP=SHR,DSN=HPS.SHPSLMD0
//SYSLIN DD *
INCLUDE SYSLMOD(LIU@IMSA) /* Global option module for IMSID=IMSA */
        ALIAS LIU@IMSB /* Alias for IMSID=IMSB */
        NAME LIU@IMSA /* Original name for IMSID=IMSA */
/*
```

## Setting up the LICON data sets

Define and initialize LICON data sets, create RDEs to register the correct DMB information, and serialize the LICON data sets. At least one LICON data set must be present to activate Integrity Checker.

### Before you begin

See [“Integrity Checker configuration requirements” on page 54](#) to determine the number of LICON data sets to create.

## Procedure

The following steps describe how to set up a single LICON data set. If more than one LICON data set is required for your environment, complete the following steps for each LICON data set.

- a. [“Defining and initializing the LICON data set” on page 66](#)
- b. [“Creating an RDE to register DMB information” on page 67](#)
- c. [“Serializing the LICON data set” on page 68](#)

### ***Defining and initializing the LICON data set***

Define the LICON data set by using the DEFINE cluster command, and initialize it by using the INIT.LICON command of the LICON utility.

## Procedure

1. Define the LICON data set by using the DEFINE CLUSTER command.

Sample JCL is in the SHPSJCL0 library, member FABLINIT. The following figure shows the DEFLICON step of the sample JCL, which defines the LICON data set.



Specify the values for the following parameters. For the CYL parameter, specify the size that you calculated in “Estimating the size of the LICON data set” on page 63.

```
//DEFLICON EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
DELETE (imshlq.licondsn) CLUSTER ERASE PURGE
SET MAXCC=0
DEFINE CLUSTER (NAME(imshlq.licondsn) -
INDEXED -
KEY (44 0) -
SHR(3 3) -
NOREUSE -
VOL (liconvol) -
CYL (pri sec) -
RECSZ (4096 32760) -
FREESPACE (xx xx)) -
DATA(NAME(imshlq.licondsn.DATA)) -
INDEX(NAME(imshlq.licondsn.INDEX))
/*
```

2. Initialize the LICON data set by using the INIT.LICON command of the LICON utility.

Sample JCL is in the SHPSJCL0 library, member FABLINIT. The following figure shows the INILICON step of the sample JCL, which initializes the LICON data set.

Add the load module data sets that contain the global option module and the LIU load module library to the STEPLIB concatenation.

```
//INILICON EXEC PGM=FABLIU00
//STEPLIB DD DISP=SHR,DSN=HPS.SHPSLMDO
// DD DISP=SHR,DSN=IMSVS.SDFSRESL
//FABLPRNT DD SYSOUT=*
//FABLIN DD *
INIT.LICON
/*
```

## Creating an RDE to register DMB information

Create an RDE to register the correct DMB information by using the LICON utility.

### About this task

This task is optional because if you do not create an RDE with the LICON utility, Integrity Checker creates an RDE automatically when the database is accessed for the first time after Integrity Checker is activated. In this case, Integrity Checker creates an RDE for each database that is accessed while IMS is online. Therefore, the performance of IMS online processing might decline depending on the number of databases. Consider creating RDEs manually by using the LICON utility to avoid performance degradation.

If you want Integrity Checker to create RDEs automatically, you can skip this task.

### Procedure

Use the LICON utility to create an RDE.

Ensure that you provide the following information with the JCL statements:

- Specify the DBD library, the ACB library, or the IMS directory that contains the DMB information to be used in DMB verifications.
- To verify the user exit routine, add the data set that contains the user exit routine to be used in DMB verifications to the STEPLIB concatenation.

Provide the INIT.DB command in the FABLIN input stream. The RDE is created in the LICON data set that is specified by the global option module found in the STEPLIB concatenation.

The following JCL example is for the LICON utility. INIT.DB DBD(\*) specifies that an RDE is created for every DBD member in the DBD library IMSVS.DBDLIB.

```

//LICJOB   JOB
//          EXEC PGM=FABLIU00
//STEPLIB DD DISP=SHR,DSN=HPS.SHPSLMD0
//          DD DISP=SHR,DSN=IMSVS.SDFSRESL
//DBDLIB  DD DISP=SHR,DSN=IMSVS.DBDLIB
//FABLPRNT DD SYSOUT=*
//FABLIN  DD *
          INIT.DB DBD(*)
/*

```

## Serializing the LICON data set

If you want more than one MVS system to access the LICON data set, you must serialize the LICON data set. This step is optional.

### Procedure

To access the LICON data set from more than one MVS system, you must install Global Resource Serialization (GRS) or a similar global enqueue product. GRS processes the resource as a global resource. The global enqueue product must propagate the enqueues to all MVS hosts. If the enqueues are not propagated to all hosts that have access to the LICON data set, the data set becomes corrupted and unusable.

The LICON data set is enqueued with the following parameters at the SYSTEMS level:

Parameter	Value
QNAME	'FABLICON'
RNAME	The name of the LICON data set

## Setting up RACF security

You can optionally set up RACF security to protect LICON data sets. If you plan to activate Integrity Checker in IMS Database Recovery Facility jobs and if DBRC command and API request authorization support is enabled with RACF, ensure that appropriate permission is given to users.

### Procedure

Complete the following steps to set up RACF security:

- [“Setting up security for LICON data sets” on page 68](#)
- [“Setting up security for IMS Database Recovery Facility jobs” on page 69](#)

### Setting up security for LICON data sets

If you want to protect the LICON data sets with RACF, complete this step. This step is optional.

### About this task

The following procedure provides a brief overview of the security setting for LICON data sets.

For more information about the security setting of the started tasks, see the topics that describe how to associate started procedures and jobs with user IDs in the *z/OS Security Server RACF System Programmers Guide* and in the *z/OS Security Server RACF Security Administrators Guide*.

### Procedure

To use RACF to protect the LICON data sets, define data set profiles for the LICON data sets. Also, because LICON data sets are accessed in each environment, consider the following requirements in both IMS online environment and batch environment.

## IMS online environment

For IMS online processing, access to the LICON data set is done by the DBRC region. In this case, the DBRC region must be assigned a user ID, preferably by using the RACF STARTED class. This assignment can also be done by using the RACF started task table (ICHRIN03) or the USER= and PASSWORD= values on the DBRC job or the task JCL. Give UPDATE access authority to the LICON data set for the user ID assigned to the DBRC region.

The following list contains an example of the statements that are used to create and enable LICON data set protection by using RACF.

```
AG licongrp
AU liconusr DFLTGRP(licongrp)
RDEF STARTED dbrcrgn.* STDATA( USER(liconusr) GROUP(licongrp))
ADDSD liuhlq.licon UACC(NONE)
PE liuhlq.licon ID(licongrp) ACCESS(UPDATE)
```

### **AG *licongrp***

Creates a RACF group named *licongrp*.

### **AU *liconusr* DFLTGRP(*licongrp*)**

Creates a RACF user ID of *liconusr* and assigns the default group *licongrp*.

### **RDEF STARTED *dbrcrgn.\** STDATA( USER(*liconusr*) GROUP(*licongrp*))**

Defines the STARTED class profile, which will assign the user ID to the *dbrcrgn* procedure. This statement assumes that the PDS member name of the procedure that is started is *dbrcrgn*. This statement assigns user ID *liconusr* to the started procedure.

### **ADDSD *liuhlq.licon* UACC(NONE)**

Defines a data set profile for the LICON data set.

### **PE *liuhlq.licon* ID(*licongrp*) ACCESS(UPDATE)**

Gives the *licongrp* group UPDATE access to the LICON data set.

## Batch environment

The user ID created for the DBRC online region cannot be used because jobs can be submitted by many different users. The user ID will be used if the ID is correctly assigned through the use of the RACF STARTED class by coding entries for job names in the STARTED class and associating those entries with the user ID. However, the STARTED class is used only when the batch jobs are started with the MVS START command. Jobs submitted to a JES reader will not invoke a call to the STARTED class. Therefore, they might not be assigned a user ID that allows appropriate access to the LICON data set. In this case, all users authorized to run batch jobs must be identified and connected to a group that has UPDATE access to the LICON data set.

## Setting up security for IMS Database Recovery Facility jobs

If you plan to activate Integrity Checker in IMS Database Recovery Facility jobs, complete this step.

## Procedure

When you activate Integrity Checker in an IMS Database Recovery Facility job, Integrity Checker uses the DBRC command utility and the DBRC API. If you protect the DBRC command and DBRC API request authorization support with RACF by permitting appropriate user access to the profiles, you must permit appropriate users of jobs to use the following DBRC commands and DBRC API requests:

### **DBRC command**

LIST.RECON

### **DBRC API requests**

- STARTDBRC
- STOPDBRC
- RELBUF
- QUERY,TYPE=DB
- QUERY,TYPE=PART

For more information about the RACF settings for DBRC commands and DBRC API requests, see the topic "DBRC security" in *IMS System Administration*.

## Customizing LIU load modules

Customize the LIU load modules to activate Integrity Checker.

### Before you begin

See [“LIU load module library customization” on page 53](#) to determine which method you use to customize the LIU load modules.

### Procedure

Customize the LIU load modules by using either of the following methods:

- [“Method 1. Customizing LIU load modules by creating alias name DSPCRTR0” on page 70](#)
- [“Method 2. Customizing LIU load modules by merging into the IMS SDFSRESL library” on page 72](#)

#### **Method 1. Customizing LIU load modules by creating alias name DSPCRTR0**

Create an alias name DSPCRTR0, APF-authorize the LIU load module library, and add DD statements to JCL and procedures of DBRC, IMS batch applications, IMS utilities, and IMS tools.

### Procedure

1. Create alias name DSPCRTR0 by link-editing the FABLRTR0 load module.

Complete this step if either of the following conditions apply:

- You are activating Integrity Checker for the first time.
- You removed the alias name DSPCRTR0 by completing the steps in the topic ["Deactivating Integrity Checker when IMS Library Integrity Utilities is installed as a component of an IMS solution pack"](#) in the *IMS Library Integrity Utilities User's Guide* and you want to reactivate Integrity Checker.

If you are reactivating Integrity Checker and the DSPCRTR0 alias that was created in the last activation still exists, you can skip this step.

You can use the following JCL example to create alias name DSPCRTR0. This JCL is in the SHPSJCL0 library, member FABLALSC.

When the job ends, confirm that the return code is 0.

```
//FABLALSC JOB
//*-----
//*   STEP1: Add the alias DSPCRTR0
//*-----
//LINK   EXEC PGM=IEWL,REGION=0M,
//      PARM='SIZE=(880K,64K),LET,LIST,NCAL,RENT,REFR,XREF'
//*   IEWL = IEWBLINK
//*
//SYSPRINT DD  SYSOUT=*
//SYSLMOD DD  DISP=OLD,DSN=LIU.SHPSLMD0  LIU target load module lib
//SYSUT1   DD  UNIT=SYSDA,SPACE=(CYL,(10,1))
//* CAUTION!!!
//*   SPECIFY SHPSLMD0 TO THE INCLUDE STATEMENT.
//*   IF YOU SPECIFY AHPSMOD0 TO THE INCLUDE STATEMENT,
//*   THE NON-ACCEPTED CHANGES WILL BE DELETED.
//SYSLIN   DD  *
//          ENTRY   FABLRTR0
//          INCLUDE  SYSLMOD(FABLRTR0)
//          ALIAS    DSPCRTR0
//          NAME     FABLRTR0(R)
//*
```

2. APF-authorize the LIU load module library.

The LIU load module library and the load module data sets that contain the global option modules must be APF-authorized.

3. Add DD statements to JCL and procedures of DBRC, IMS batch applications, IMS utilities, and IMS tools.

You must add DD statements to JCL and cataloged procedures for all the jobs that you want to activate Integrity Checker in. These JCL and procedures include those for DBRC, IMS batch applications, IMS utilities, and IMS Tools jobs that update IMS databases.

**Important:** For integrity, ensure that all JCL and procedures that might change databases meet the following STEPLIB DD requirements.

Add the following DD statements:

#### STEPLIB DD

Add the load module data sets that contain the global option module and the LIU load module library to the STEPLIB concatenation.

The LIU load module library must be concatenated before the IMS load module library and must be APF-authorized.

If you want Integrity Checker to detect changes in the logic of IMS user exits, which include randomizing routines, segment edit/compression exit routines, and HALDB or DEDB partition selection exit routines, also include the exit load modules in the STEPLIB concatenation. Integrity Checker does not check the user exit load modules in the LPA, ELPA, or LNKLST.

#### FABLPRNT DD

Optionally, you can specify the FABLPRNT DD statement in your procedures. This statement causes Integrity Checker to generate messages in the DD.

If this statement is specified, Integrity Checker writes messages into this DD in addition to issuing the WTO macro. Each message contains a time stamp in its prefix, and you can easily identify the messages in relation to the authorization request from your application programs.

#### FABLSNAP DD

Optionally, you can specify the FABLSNAP DD statement in your online DBRC procedure. This statement causes Integrity Checker to generate diagnostic information for the VSAM control blocks when Integrity Checker gets a VSAM error. For DL/I batch jobs, you do not need to specify this DD statement because the jobs issue an abend dump when they get a VSAM error.

### Example

The following figures show examples of the procedures.

```
//          PROC RGN=64M,DPTY='(14,15)',SOUT=A,
//          IMSID=SYS3,SYS2=,IMSPLEX=
//IEFPROC EXEC PGM=DFSMVRC0,REGION=&RGN,
//          DPRTY=&DPTY,PARM='DRC,&IMSID,IMSPLEX=&IMSPLEX'
//*****
//*
//STEPLIB DD DSN=HPS.SHPSLMD0,DISP=SHR <<---- STEPLIB DD
//          DD DSN=IMS.&SYS2.SDFSRESL,DISP=SHR
//PROCLIB DD DSN=IMS.&SYS2.PROCLIB,DISP=SHR
//JCLOUT DD SYSOUT=(A,INTRDR)
//JCLPDS DD DSN=IMS.&SYS2.PROCLIB,DISP=SHR
//SYSUDUMP DD SYSOUT=&SOUT
//SYSABEND DD SYSOUT=&SOUT
//FABLPRNT DD SYSOUT=&SOUT <<---- FABLPRNT DD
//FABLSNAP DD SYSOUT=&SOUT <<---- FABLSNAP DD
```

Figure 8. Example of DBRC procedure for a non-BPE-based DBRC region

```

//DBRC   PROC   RGN=0M,SOUT=A,
//        RESLIB='IMS.SDFSRESL',
//        BPECFG=BPECONFG,
//        DBRCINIT=000,
//        IMSID=IMS1,
//        PARM1='BPEINIT=DSPBINIO'
// *
//DBRCPROC EXEC PGM=BPEINI00,REGION=&RGN,
// PARM='BPECFG=&BPECFG,DBRCINIT=&DBRCINIT,IMSID=&IMSID,&PARM1'
// *
//STEPLIB DD DSN=HPS.SHPSLMD0,DISP=SHR      <<---- STEPLIB DD
//        DD DSN=&RESLIB,DISP=SHR
//        DD DSN=SYS1.CSSLIB,DISP=SHR
//PROCLIB DD DSN=IMS.PROCLIB,DISP=SHR
//SYSPRINT DD SYSOUT=&SOUT
//SYSUDUMP DD SYSOUT=&SOUT
//JCLOUT  DD SYSOUT=(A,INTRDR)
//JCLPDS  DD DSN=IMS.PROCLIB,DISP=SHR
//SYSABEND DD SYSOUT=&SOUT
//FABLPRNT DD SYSOUT=&SOUT                  <<---- FABLPRNT DD
//FABLSNAP DD SYSOUT=&SOUT                  <<---- FABLSNAP DD

```

Figure 9. Example of DBRC procedure for a BPE-based DBRC region

```

//        PROC   MBR=TEMPNAME,PSB=,BUF=7,
//        SPIE=0,TEST=0,EXCPVR=0,RST=0,PRLD=,
//        SRCH=0,CKPTID=,MON=N,LOGA=0,FMTO=T,
//        IMSID=,SWAP=,DBRC=,IRLM=,IRLMNM=,
//        BKO=N,IOB=,SSM=,APARM=,
//        RGN=4M,
//        SOUT=A,LOGT=2400,SYS2=,
//        LOCKMAX=,GSGNAME=,TMINAME=,
//        IMSPLEX=
//G        EXEC PGM=DFSRR00,REGION=&RGN,
//        PARM=(DLI,&MBR,&PSB,&BUF,
//        &SPIE&TEST&EXCPVR&RST,&PRLD,
//        &SRCH,&CKPTID,&MON,&LOGA,&FMTO,
//        &IMSID,&SWAP,&DBRC,&IRLM,&IRLMNM,
//        &BKO,&IOB,&SSM,'&APARM',
//        &LOCKMAX,&GSGNAME,&TMINAME,
//        &IMSPLEX)
//STEPLIB DD DSN=HPS.SHPSLMD0,DISP=SHR      <<---- STEPLIB DD
//        DD DSN=IMS.&SYS2.SDFSRESL,DISP=SHR
//        DD DSN=IMS.&SYS2.PGMLIB,DISP=SHR
//DFSRESLB DD DSN=IMS.&SYS2.SDFSRESL,DISP=SHR
//IMS      DD DSN=IMS.&SYS2.PSBLIB,DISP=SHR
//        DD DSN=IMS.&SYS2.DBDLIB,DISP=SHR
//PROCLIB DD DSN=IMS.&SYS2.PROCLIB,DISP=SHR
//IEFRDER DD DSN=IMSL0G,DISP=(,KEEP),VOL=(,,99),
//        UNIT=(&LOGT,,DEFER),
//        DCB=(RECFM=VB,BLKSIZE=4096,
//        LRECL=4092,BUFNO=2)
//IEFRDER2 DD DSN=IMSL0G2,DISP=(,KEEP),VOL=(,,99),
//        UNIT=(&LOGT,,DEFER,SEP=IEFRDER),
//        DCB=(RECFM=VB,BLKSIZE=4096,
//        LRECL=4092,BUFNO=2)
//SYSUDUMP DD SYSOUT=&SOUT,
//        DCB=(RECFM=FBA,LRECL=121,BLKSIZE=605),
//        SPACE=(605,(500,500),RLSE,,ROUND)
//IMSMON  DD DUMMY
//FABLPRNT DD SYSOUT=&SOUT                  <<---- FABLPRNT DD

```

Figure 10. Example of DLIBATCH procedure

## Method 2. Customizing LIU load modules by merging into the IMS SDFSRESL library

Back up the IMS SDFSRESL library, and then merge the LIU load modules into the IMS SDFSRESL library.

### Procedure

1. Back up the IMS SDFSRESL library.

When program temporary fixes (PTFs) are released for the DSPCRTR0 module, you must restore the DSPCRTR0 module from the backup to apply the PTFs. Therefore, before merging LIU load modules,

you must create a backup of the IMS SDFSRESL library. The backup is also required to deactivate Integrity Checker.

2. Use SMP/E to apply and accept IMS and IMS Library Integrity Utilities maintenance, and ensure that both are at the latest maintenance level.
3. Run the FABLUMD1 job that is in the SHPSJCL0 JCL library.

This job updates the SMP/E CSI of IMS. It runs SMP/E RECEIVE/APPLY of USERMOD to install the FABLRTR0 module into the IMS SDFSRESL library. The FABLUMD1 job is shown in [“JCL example to install the FABLRTR0 module into the IMS SDFSRESL library”](#) on page 73.

4. Merge the LIU load modules (FABL\* members) in the target library SHPSLMD0 into the IMS SDFSRESL library.

If this step is not done, when Integrity Checker is activated, an ABENDU0109 load failure occurs for the required LIU load modules.

### JCL example to install the FABLRTR0 module into the IMS SDFSRESL library

```
//FABLUMD1 JOB
/*-----
/* STEP1: SMP/E RECEIVE/APPLY usermod ZZLIU01 to IMS CSI
/*-----
//STEP1 EXEC procedure name of IMS SMP/E job
/*
/*
//AHPSMOD0 DD DISP=SHR,DSN=LIU.AHPSMOD0
/*
//SMPPTFIN DD DATA,DLM=@@
++USERMOD(ZZLIU01) /* LIU R2 USERMOD */
REWORK(2004058) /* */
/*
/* OPTIONAL LIU USERMOD FOR IMS-DBRC FMIDS. */
/* APPLY THIS USERMOD TO IMS-DBRC SMP/E CSI ONLY IF YOU WANT TO */
/* INSTALL LIU-MODIFIED VERSION OF DSPCRTR0 INTO YOUR IMS SMP/E */
/* CSI. */
/*
/* BEFORE APPLYING THIS USERMOD, ALL MAINTENANCE FOR IMS-DBRC */
/* DSPCRTR0 MUST BE ACCEPTED OR RESTORED. */
/*
++VER(P115) /* IMS SYSTEM ID/FMID */
FMID(FMID of IMS) /*
/*
++JCLIN CALLLIBS /* JCLIN FOR LIU MODULES */
/*
//LINK EXEC PGM=IEWL,REGION=0M,
// PARM='SIZE=(880K,64K),LET,LIST,NCAL,RENT,REFR,XREF'
//SYSPRINT DD SYSOUT=A
//AHPSMOD0 DD DISP=OLD,DSN=LIU.AHPSMOD0
//ADFSLOAD DD DISP=OLD,DSN=IMS.ADFSLOAD
//SYSLMOD DD DISP=OLD,DSN=IMS.SDFSRESL
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(10,1))
//SYSLIN DD *
INCLUDE AHPSMOD0(FABLRTR0)
INCLUDE ADFSLOAD(DSPCRTR0)
ENTRY FABLRTR0
NAME DSPCRTR0(R)
/*
++MOD (FABLRTR0) LKLIB(AHPSMOD0) /* LIU MODULE MOD ENTRY */
@@
//SMPCNTL DD *
SET BDY (GLOBAL).
RECEIVE S (ZZLIU01) SYSMODS.
SET BDY (TZONE name of IMS).
APPLY S (ZZLIU01).
/*
```

## Configuring for a BPE-based DBRC environment

To activate Integrity Checker in an IMS online environment that has a BPE-based DBRC region, you must configure the members of the IMS PROCLIB data set. This step is required only when a BPE-based DBRC is used.

### Procedure

1. Set up the BPE configuration parameter member.

Specify the DBRC user exit list member by using the EXITMBR statement in the BPE configuration parameter member. The BPE configuration parameter member is specified by the BPECFG= keyword in the DBRC procedure that is used for the BPE-based DBRC region in which you want to activate Integrity Checker.

You can skip this step if the EXITMBR statement for the DBRC user exit list member already exists.

The following example specifies the EXITMBR statement in a BPE configuration parameter member:

```
#
# User exit list PROCLIB member specification
#
EXITMBR=(member_name,DBRC) /* DBRC user exit list member */
```

For more information about the EXITMBR statement, see the topic "BPE configuration parameter member of the IMS PROCLIB data set" in *IMS System Definition*.

2. Set up the DBRC user exit list member.

Specify the Integrity Checker load module FABLBIN0 on the EXITDEF statement. The FABLBIN0 module must be specified as a DBRC Request exit in the DBRC user exit list member. The DBRC user exit list member is specified by the EXITMBR statement for DBRC in the BPE configuration parameter member.

- When you have two or more DBRC user exits, the FABLBIN0 module must be specified as the first member on the EXITDEF statement.
- Do not specify the ABLIM parameter on the EXITDEF statement.

The following example specifies the Integrity Checker load module on the EXITDEF statement:

```
*****
* DBRC USER EXIT LIST PROCLIB MEMBER *
*****
#-----#
# DEFINE a DBRC request user exit. #
#-----#
EXITDEF (TYPE=REQUEST, EXITS=(FABLBIN0), COMP=DBRC)
```

For information about the EXITDEF statement, see the topic "BPE exit list members of the IMS PROCLIB data set" in *IMS System Definition*.

## Verifying that Integrity Checker is activated

IMS Library Integrity Utilities provides sample JCL for verifying successful activation of Integrity Checker. You can modify the sample JCL and then use it to ensure that Integrity Checker is running correctly.

### About this task

This task is optional. Complete this task only if you want to ensure that Integrity Checker is activated.



## Procedure

In the SHPSJCL0 library, locate sample JCL member FABLIVP3. Modify the sample JCL by following the instructions in the sample JCL and submit the JCL. Ensure that the job ends without errors.

## Restarting IMS online and running IMS batch application, IMS utility, and IMS Tools jobs

When you have done all the steps, you are ready to restart IMS online to activate the DMB verification process.

## Procedure

1. Restart IMS online and run IMS batch application jobs, IMS utility jobs, and IMS Tools jobs.
2. Confirm that the DMB verification process is activated by locating the following WTO message:

```
FABL0114I LIU INTEGRITY CHECKER ACTIVATED. IMS VERSION IS version
```

## Global option module generation macro

Use the global option module generation macro to create global option modules.

### Creating global option modules

To activate Integrity Checker, create at least one global option module that contains the name of the LICON data set. If you want to change the default options of Integrity Checker globally, specify them when you create this module.

### About this task

IBM does not supply global option modules. You must create at least one global option module before invoking Integrity Checker.

## Procedure

To create a global option module, determine the type of the global option module, then use the FABLPGEN procedure (provided in the SHPSSAMP data set) to create it. Runtime options can be defined by using the SYSIN control statements.

There are two levels of global option modules that can be categorized by their effective range: installation level and IMS subsystem level.

### Installation level

To set values that will be effective at the installation level, create a global option module named LIU@INST. The values in this module apply to all the databases that are defined in the IMS environment.

### IMS subsystem level

To set values that will be effective at the IMS subsystem level, create a global option module named LIU@*imsid*, where *imsid* is the 4-character ID of the IMS subsystem. The values that you set in this module apply to all the databases that are defined to that IMS subsystem. In accordance with the options assignment rule, they override the values that are set in the LIU@INST module.

**Tip:** If you want more than one IMS subsystems to use a set of options that are defined in a single global option module, create a global option module for the IMS subsystem level and use the linkage editor to assign an alias to that global option module.

In a database sharing environment where more than one IMS subsystem shares databases, the LICON data set and option values defined in the global option module must be the same across the IMS subsystems. Assigning an alias is beneficial in such a case as well as in XRF environments. For

information about how to assign an alias name, see [“Setting up the global option modules”](#) on page 65.

In environments where a LICON data set is used across multiple IMS subsystems, assigning an alias name for the global option module to apply the same runtime options for all IMS IDs is a good practice. However, if you want to set runtime options for each IMS ID, instead of assigning an alias name to the global option module, you can create one global option module for each IMS ID. In such a case, except for certain control statement keywords, the keyword parameters must be the same. You can set different parameters for the following control statement keywords:

- VERIFY=
- MSGROUT=
- MSGDESC=
- VERIFYLMT=
- RDEBUILD=
- INITERR=

When you create global option modules, name the modules LIU@xxxx. At sign (@) is a code-page-dependent character. If you are working in an environment where you cannot use the at sign (@), name the modules LIUGxxxx. Use either format for all the global option modules consistently because maintaining both LIU@xxxx and LIUGxxxx modules can cause confusion. If Integrity Checker finds both LIU@*imsid* and LIUG*imsid* in the same effective range level, Integrity Checker ignores LIUG*imsid* and uses LIU@*imsid*.

## JCL requirements for the FABLPGEN program

The following JCL requirements must be met to create a global option module with the FABLPGEN program.

Subsections:

- [“EXEC statement”](#) on page 76
- [“DD statements”](#) on page 76
- [“Control statement keywords”](#) on page 77
- [“Example”](#) on page 81

## EXEC statement

The EXEC statement must be in the following form.

```
//stepname EXEC FABLPGEN,MBR=module,SOUT=x
```

### MBR=

Specifies the name of the global option module. *module* is LIU@INST, LIUGINST, LIU@*imsid*, or LIUG*imsid*.

### SOUT=

Specifies the SYSOUT class to be used for SYSPRINT DD.

## DD statements

Code the following DD statements to identify the source of input and the placement of output information:

### SYSLIB DD

This statement specifies the macro library (SHPSMAC0) provided by IMS Library Integrity Utilities, or one of IMS tools solution packs. This library contains the FABLPGEN macro.

### SYSIN DD

This statement specifies the input control statement stream.

## **SYSLMOD DD**

This statement specifies the output data set for global option modules. If you merge the Integrity Checker load modules into the IMS SDFSRESL library, specify the IMS SDFSRESL library for this DD statement. Otherwise, specify the Integrity Checker load module library for this DD statement.

You can create global option modules in a different library. If you do so, concatenate that library to the STEPLIB DD in JCL and cataloged procedures for all the jobs from which you want to activate Integrity Checker.

## **Control statement keywords**

The control statement formats are as follows:

### **FABLPGIN**

The IBM supplied macro for use in defining the global option module. The syntax of the parameter specifications of this macro is the same as the syntax of an ordinary assembler macro statement.

You must specify the statement label for the FABLPGIN macro. For the statement label, specify the name of the global option module, which is LIU@INST, LIUGINST, LIU@*imsid*, or LIU*Gimsid* (in the example in [Figure 11](#) on page 81, LIU@INST beginning at column 1.)

### **LICON=**

Specifies the name of the LICON data set. No system default value is provided for this parameter.

### **VERIFY=**

Specifies the method for verifying the DMBs; either SNGL or DBLE. SNGL specifies single-step verification and DBLE specifies double-step verification. The system default value for this parameter is SNGL.

You can choose either of the following two options for how Integrity Checker verifies the DMB of a full-function database against the DMB information registered in the RDE. Specify your choice in the global option module.

#### **Single-step verification**

Integrity Checker verifies all elements at once. This method is more reliable than the double-step method, but slower.

#### **Double-step verification**

Integrity Checker verifies the version ID of the DMB in the first step. Version ID is the 13-character time stamp of when the DBD was created or the character string that is specified on the VERSION= keyword of the DBD statement that was supplied for DBDGEN. If the version IDs are not the same, Integrity Checker proceeds to the next step to verify other elements. This method is faster than the single-step method, but less reliable.

For DEDBs, single-step verification is always applied.

**Recommendation:** Specify single-step verification. If you experience a performance problem, consider using double-step verification.

### **MSGROUT=**

Specifies the message routing codes for write-to-operator (WTO) messages issued by Integrity Checker. You can specify values in the range of 1 - 16. The system default value for this parameter is (2,7,11).

### **MSGDESC=**

Specifies the message descriptor codes for write-to-operator (WTO) messages issued by Integrity Checker. The system default value for this parameter is (7).

### **VERIFYLMT=**

Specifies the maximum number of the mismatch messages to be issued for a DMB. For example, specifying 3 means Integrity Checker does not issue more than three mismatch messages for a DMB.

You can specify any number in the range of 0 - 99. 0 specifies that verification is to be done but no mismatch message issued. 99 specifies that the number of messages is unlimited. The system default value for this parameter is 10.

**RDEBUILD=**

Specifies whether Integrity Checker automatically creates an RDE. The system default value for this parameter is Y.

**Y**

If no current RDE exists for a DEDB area, a non-HALDB full-function database, or a HALDB partition, Integrity Checker automatically creates an RDE during the first access to it.

**N**

Even when no current RDE exists for a DEDB area, a non-HALDB full-function database, or a HALDB partition, Integrity Checker does not create an RDE during the first access to it.

**INITERR=**

Specifies whether Integrity Checker abnormally ends, or issues a warning message and stops its processing, when the initialization of Integrity Checker fails. The system default value for this parameter is A.

This option is not effective in an IMS online subsystem that has a BPE-based DBRC region. If you specify this option for such an environment, Integrity Checker stops processing, and the IMS online subsystem continues processing.

**A**

If the initialization of Integrity Checker fails, it ends abnormally together with the IMS online subsystem that has a non-BPE-based DBRC region or the IMS batch job.

**W**

If the initialization of Integrity Checker fails, it issues a warning message and stops its processing. The IMS online subsystem or the IMS batch job continues processing without the Integrity Checker function. However, Integrity Checker ends abnormally if errors occur before the effective value for this option is decided. Such errors are load failures of the following modules:

- FABLRTRx (x: 8, 9, A, B, C, or D)
- FABLWMO
- FABLAIO
- Global option module

**CHECKON=**

Specifies the verification option for online IMS subsystems. The system default value for this parameter is (Y,D). You can specify the following options:

**Y**

Check. If you specify Y, you can specify either of the following parameters:

**D**

If a mismatch is found, deny authorization to use the database.

**W**

Issue a warning message and create a new RDE.

**N**

Do not check.

**CHECKBAT=**

Specifies the verification option for batch jobs. The system default value for this parameter is (Y,D). You can specify the following options:

**Y**

Check. If you specify Y, you can specify either of the following parameters:

**D**

If a mismatch is found, deny authorization to use the database.

**W**

Issue a warning message and create a new RDE.

**N**

Do not check.

**CHECKLD=**

Specifies the verification option for user load program jobs. The system default value for this parameter is (Y,D). You can specify the following options:

**Y**

Check. If you specify Y, you can specify either of the following parameters:

**D**

If a mismatch is found, deny authorization to use the database.

**W**

Issue a warning message and create a new RDE.

**N**

Do not check.

**CHECKIC=**

Specifies the verification option for batch image copy jobs. The system default value for this parameter is (Y,D). You can specify the following options:

**Y**

Check. If you specify Y, you can specify either of the following parameters:

**D**

If a mismatch is found, deny authorization to use the database.

**W**

Issue a warning message and create a new RDE.

**N**

Do not check.

**CHECKRV=**

Specifies the verification option for database recovery jobs. The system default value for this parameter is (Y,D). You can specify the following options:

**Y**

Check. If you specify Y, you can specify either of the following parameters:

**D**

If a mismatch is found, deny authorization to use the database.

**W**

Issue a warning message and create a new RDE.

**N**

Do not check.

**CHKRAND=**

Specifies whether to verify changes in randomizing routines by checksum. The system default value for this parameter is N. You can specify the following options:

**Y**

Check.

**N**

Do not check.

If CHECKON, CHECKBAT, CHECKLD, CHECKIC, or CHECKRV is set to Y, this specification is effective in each IMS environment.

**CHKCOMP=**

Specifies whether to verify changes in segment edit/compression routines by checksum. The system default value for this parameter is N. You can specify the following options:

**Y**

Check.

**N**

Do not check.

If CHECKON, CHECKBAT, CHECKLD, CHECKIC, or CHECKRV is set to Y, this specification is effective in each IMS environment.

**CHKPSEL=**

Specifies whether to verify changes in HALDB partition selection exit routines by checksum. The system default value for this parameter is N. You can specify the following options:

**Y**

Check.

**N**

Do not check.

If CHECKON, CHECKBAT, CHECKLD, CHECKIC, or CHECKRV is set to Y, this specification is effective in each IMS environment.

**CHKFPSEL=**

Specifies whether to verify changes in DEDB partition selection exit routines by checksum. The system default value for this parameter is N. You can specify the following options:

**Y**

Check.

**N**

Do not check.

If CHECKON, CHECKBAT, CHECKLD, CHECKIC, or CHECKRV is set to Y, this specification is effective in each IMS environment.

**GENMAX=**

Specifies the maximum number of expired RDEs to be kept in the LICON data set for use in recoveries. The system default value for this parameter is 0 (do not keep expired RDEs). A maximum of 15 RDE copies can be kept.

**RECUPD=**

Specifies whether to record database update access information. The system default value for this parameter is N. You can specify the following options:

**Y**

Record.

**N**

Do not record.

**RECLD=**

Specifies whether to record database load access information. The system default value for this parameter is N. You can specify the following options:

**Y**

Record.

**N**

Do not record.

**RECU=**

Specifies whether to record database unload access information. The system default value for this parameter is N. You can specify the following options:

**Y**

Record.

**N**

Do not record.

## Example

Sample JCL is in the SHPSJCL0 library, member FABLINIT. The following figure shows the CREGOM step of the sample JCL, which creates global option module LIU@INST.

The name of a global option module can be LIU@INST, LIU@*imsid*, LIUGINST, or LIUG*imsid*. Replace LIU@INST in the JCL example to create a module with one of these names.

```
//CREGOM EXEC FABLPGEN,MBR=LIU@INST,SOUT=A
//C.SYSLIB DD DISP=SHR,DSN=HPS.SHPSMAC0
//C.SYSIN DD *
LIU@INST FABLPGIN VERIFY=SNGL,      single step verification           X
                MSGROUT=(2,7,11),  WTO message routing codes       X
                MSGDESC=(7),        WTO message descriptor codes      X
                VERIFYLMT=5,        max number of mismatch messages    X
                CHECKON=(Y,D),      verification option - online       X
                CHECKBAT=(Y,D),     verification option - batch        X
                CHECKLD=(Y,D),      verification option - load        X
                CHECKIC=(Y,D),      verification option - image copy   X
                CHECKRV=(Y,D),      verification option - recovery      X
                GENMAX=3,           max number of expired RDE kept      X
                LICON=imshlq.licondsn
                END
/*
//L.SYSLMOD DD DISP=SHR,DSN=HPS.USERLIB(&MBR)
```

Figure 11. JCL for creating a global option module LIU@INST

## Setting up the ISPF interface

---

IMS Fast Path Solution Pack provides an ISPF interface for Database Repair Facility.

You can run Database Repair Facility interactively with the ISPF interface or in batch mode. When using the ISPF interface, it is panel driven, and to make changes to your database's pointers and data, simply enter the required information in the panel.

The ISPF interface of Database Repair Facility can be used without customization.





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## Chapter 7. Troubleshooting

Use these topics to diagnose and correct problems that you experience with IMS Fast Path Solution Pack.

While you customize IMS Fast Path Solution Pack, IMS Fast Path Solution Pack components issue messages to help you track progress and to inform you when errors occur. For an explanation of the messages, refer to the corresponding product's user guide. See [“Product publications” on page 13](#).

### Gathering diagnostic information

Before you report a problem with IMS Fast Path Solution Pack to IBM Software Support, you need to gather the appropriate diagnostic information.

Provide the following information for all IMS Fast Path Solution Pack problems:

- A clear description of the problem and the steps that are required to re-create the problem.
- The version of IMS and the version of the operating system that you are using.
- A complete log of the job.
- The maintenance level of the product or the component.

Run the Diagnostics Aid program that is provided by the product or the component in error to generate a Load Module/Macro APAR Status report. Provide the report when you contact IBM Software Support. For information about creating a Load Module/Macro APAR Status report, see the documentation of the individual products.

For problems with IMS Fast Path Advanced Tool and IMS Fast Path Online Tools, in addition to the diagnostics information in the list, provide the snap dump that is generated in the HFPABEND data set or in the SYSOUT data set. The snap dump is generated only when either of the tools ends abnormally.



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