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## Highlights

- Provides one-step IMS database reorganization with minimal impact to database availability
  - Supports IMS Full Function databases including HALDBs, internal logical relationships and secondary indexes
  - Automates all IMS database reorganization steps including Unload, Reload, Prefix Resolution, Prefix Update, Secondary Index Rebuilding, and Image Copying in a single job step
  - Program Number: 5655-H97
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## IMS Online Reorganization Facility

*Provides Online Reorganization with Minimal Database Impact*

IMS™ is IBM's premier transaction and hierarchical database management system. IMS was designed for high availability, superior performance, growth and capacity, and full database integrity. The ability to operate and manage this highly complex IMS system and database environment determines the Total Cost of Operation (TCO). The IBM® IMS Tools lowers TCO by equipping IMS system programmers and IMS database administrators (DBAs) with the facilities they need to effectively monitor and manage this mission-critical environment. The IBM IMS Tools provide automation, validation, and auditing of all database and transaction management activities.

The *IMS Online Reorganization Facility* tool performs all of the IMS database reorganization tasks including unloading the database, prefix resolution for IMS internal logical relationships, rebuilding IMS secondary indexes, IMS database pointer checking, and IMS image copying of the reorganized database, in a single job step while the IMS database is still online. The tool supports conditional reorganization by evaluating whether the database requires reorganization and only performs it when it is necessary. The *IMS Online Reorganization Facility* allows full access to the IMS database during the reorganization and only takes the database offline for a brief period of time.



## IMS Online Reorganization Facility

When IMS databases are changed frequently with record updates, deletions and insertions, the IMS databases lose their optimal structure. This is when IMS database reorganizations are required to restore data clustering and distribute free space evenly. An IMS database which is well-structured improves IMS application performance. As businesses move to 24x7x365 day operations, key IMS databases need to be reorganized with minimal IMS application unavailability. The *IMS Online Reorganization Facility* provides IMS Database Administrators (DBA's) with the ability to reorganize an IMS database while allowing full IMS application access to the database.

### IMS Database Solution Key Component

The *IMS Online Reorganization Facility* tool is part of the *IMS Database Solution Pack* as shown in Figure 1.

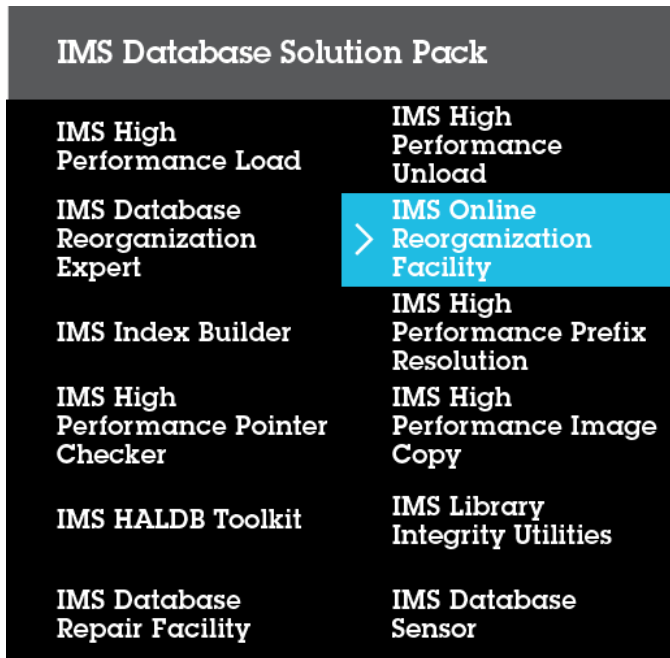


Figure 1: IMS Online Reorganization Facility in IMS Database Solution

### IMS Online and Offline Reorganization

The *IMS Online Reorganization Facility* product provides online reorganization with minimal database unavailability. It handles all of the tasks required to reorganize an IMS database in a single job step including unloading and reloading the data, resolving database

prefixes, rebuilding secondary indexing, validating database pointers, and image copying the reorganized database. The offline IMS database reorganization is provided by the *IMS Database Reorganization Expert* product.

### IMS Online Reorganization Process

The *IMS Online Reorganization Facility* uses the robust process shown in Figure 2.

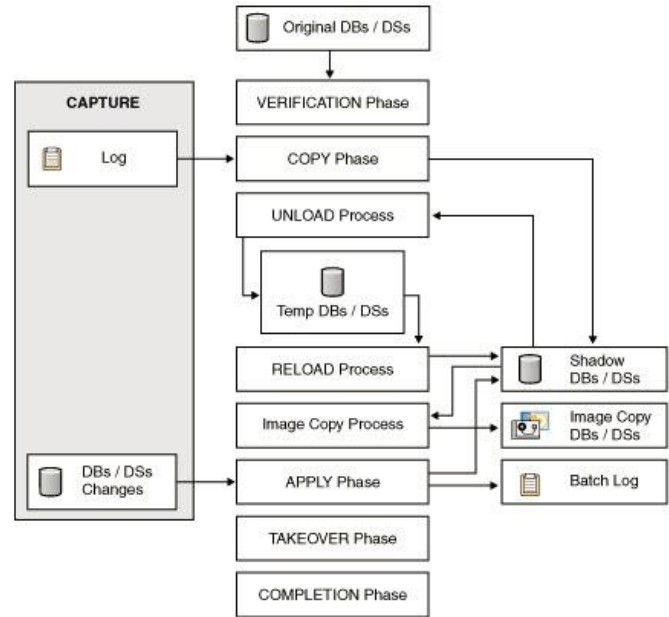


Figure 2: IMS Online Reorganization Facility Process

### IMS Online Reorganization (Verification)

The verification phase is the first phase of the online reorganization process. The *IMS Online Reorganization Facility* uses this phase to validate that the IMS database can be reorganized. The tool checks the IMS release and component levels, the DBRC registration and database DBD definitions, the tool control statements, and the shadow and temporary data sets are allocated correctly. The reorganization continues if this verification step completes successfully.

### IMS Online Reorganization (Copy)

The *IMS Online Reorganization Facility* uses the copy phase to copy all of the data from the original IMS database data sets to the shadow data sets. The IMS databases are briefly paused to allow the database buffers to be flushed to the IMS database data sets ensuring the latest updates are captured in the original IMS database data sets. Then the original IMS database data sets are copied to the shadow IMS

database data sets. When this copy is completed, a second brief pause is performed to capture any updates that were made to the original IMS database data sets and these updates are also applied to the shadow data sets. For IMS HIDAM and PHIDAM databases, the shadow primary index is built from the shadow IMS database data sets. If there are secondary indexes, they are rebuilt during the Reorganization Phase.

### IMS Online Reorganization (Reorganization)

Once the shadow IMS database data sets are created, they are unloaded using the *IMS High Performance Unload* tool and reloaded using the *IMS High Performance Load* tool. If there are secondary indexes, they are also rebuilt. Internal logical relationships are resolved and updated using the *IMS High Performance Prefix Resolution* tool. The reorganized IMS shadow databases are image copied with the *IMS High Performance Image Copy* tool and can be pointer checked with the *IMS High Performance Pointer Checker* tool.

### IMS Online Reorganization (Apply)

If there are updates to the original IMS database data sets during the reorganization phase, they are captured in temporary data sets and applied to the shadow IMS database data sets during the apply phase. A /DBR command is executed internally to briefly stop any additional access to the original IMS database data sets during the apply phase.

### IMS Online Reorganization (Takeover)

When the apply phase has completed, the original IMS database data sets are swapped with the reorganized shadow IMS database data sets. IMS DBRC is notified with the REORG database status. If the IMS DBD database definitions change, the *IMS Online Reorganization Facility* performs an ACBGEN. Finally, the IMS database is restarted internally by the tool with the /START command and the takeover phase is completed.

### IMS Online Reorganization (Completion)

In the completion step, the final reports are created and the shadow IMS database data sets are deleted.

## IMS Database Data Types Supported

The *IMS Online Reorganization Facility* supports HDAM, HIDAM, HISAM, SHISAM, PHDAM, and PHIDAM database types. For HDAM, HIDAM, HISAM and SHISAM databases, the associated indexes are rebuilt during the database reorganization. The IMS High Available Large Database (HALDB) partitions with PHDAM and PHIDAM are reorganized as single partitions in a single job step. The IMS HALDB secondary index, PSINDEX, is reorganized while the IMS HALDB database remains online.

## End-To-End Reorganization Solution

The *IMS Online Reorganization Facility* tool provides the IMS Database Administrator (DBA) with an end-to-end solution for IMS database reorganization with minimal impacts to IMS database availability. The tool analyzes and evaluates space management conditions against user-defined policies to determine when thresholds have been breached. The *IMS Online Reorganization Facility* tool detects problems before they can negatively impact IMS applications.

## For more information

To learn more about the IBM IMS Tools product line, please contact your IBM representative or IBM Business Partner, or visit: [ibm.com/software/data/db2imstools/products/ims-tools.html](http://ibm.com/software/data/db2imstools/products/ims-tools.html)

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