IMS HALDB Toolkit

Convert IMS Full Function Databases to IMS HALDB Databases

Highlights

- Converts IMS Full Function databases to IMS High Availability Large Database (HALDB) databases in one step
- Simulates IMS HALDB conversions, partition consolidations and splitting, to verify partition settings
- Manages IMS HALDB maintenance procedures to optimize IMS HALDB performance and maintainability
- Program Number: 5655-N46

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 HALDB Toolkit* provides the IMS Database Administrator (DBA) with all of the tools they need to manage and maintain IMS High Availability Large Databases (HALDB) databases. This tool helps convert existing IMS Full Function databases into IMS HALDB databases. It allows IMS DBA's to simulate changes to partition settings to ensure they are correct before implementation. The *IMS HALDB Toolkit* supports partition consolidation and partition splitting to accommodate growth or shrinkage in an IMS application. The *IMS HALDB Toolkit* is fully integrated with other IMS High Performance tooling to provide special capabilities in the management of IMS HALDB databases.

IMS HALDB Toolkit

The *IMS HALDB Toolkit* provides the IMS Database Administrator (DBA) with the tools they need to convert IMS Full Function databases to IMS HALDB databases. It also gives them the ability to maintain and tune the HALDB databases. Since IMS HALDB databases are defined in IMS DBRC, the *IMS HALDB Toolkit* also provides the IMS DBA with specific IMS DBRC capabilities.

IMS Database Solution Key Component

The *IMS HALDB Toolkit* product is part of two IBM Solutions. The first is the *IMS Database Solution Pack* as shown in Figure 1, and the second is the smaller *IMS Database Utility Solution* as shown in Figure 2.

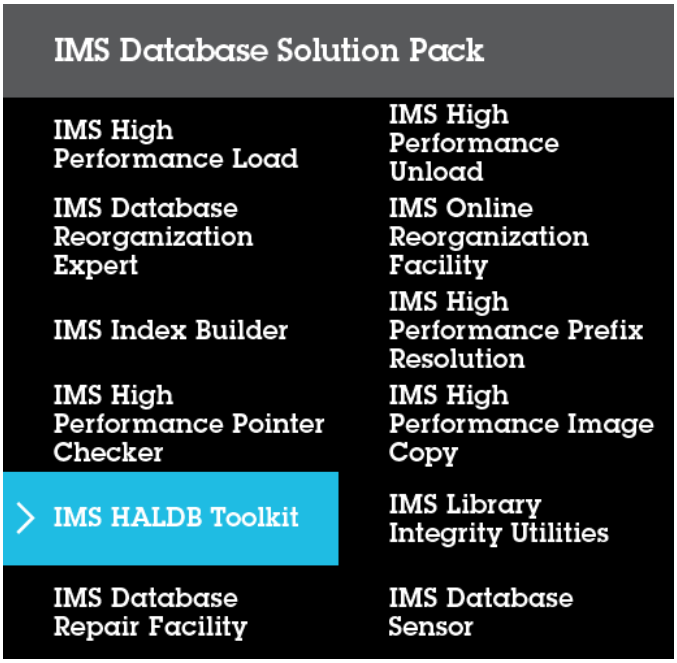


Figure 1: IMS HALDB Toolkit in the IMS Database Solution

Conversion to IMS HALDB Databases

The *IMS HALDB Toolkit* provides two functions that are critical in migrating an IMS Full Function database to an IMS HALDB database. The first function is the ability to simulate the conversion. In this regard, the user can determine the IMS HALDB partition settings that are appropriate for the current IMS Full Function database. The second function is the actual conversion from the IMS Full Function database to the IMS HALDB database. This procedure is performed in a single batch step. There is an ISPF interface that generates all of the required substeps in this process.

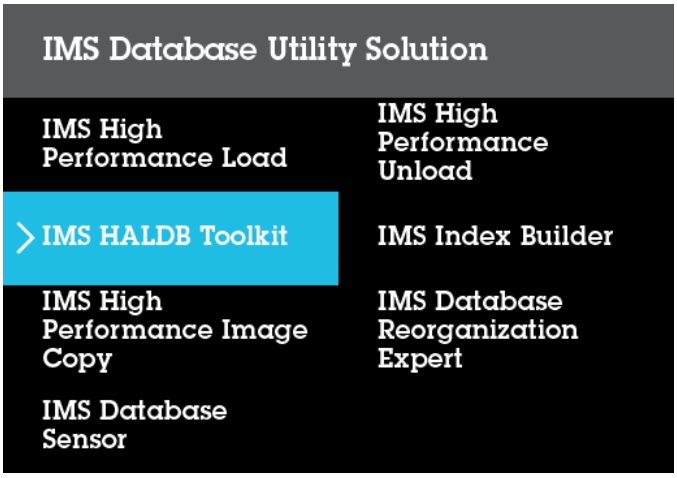
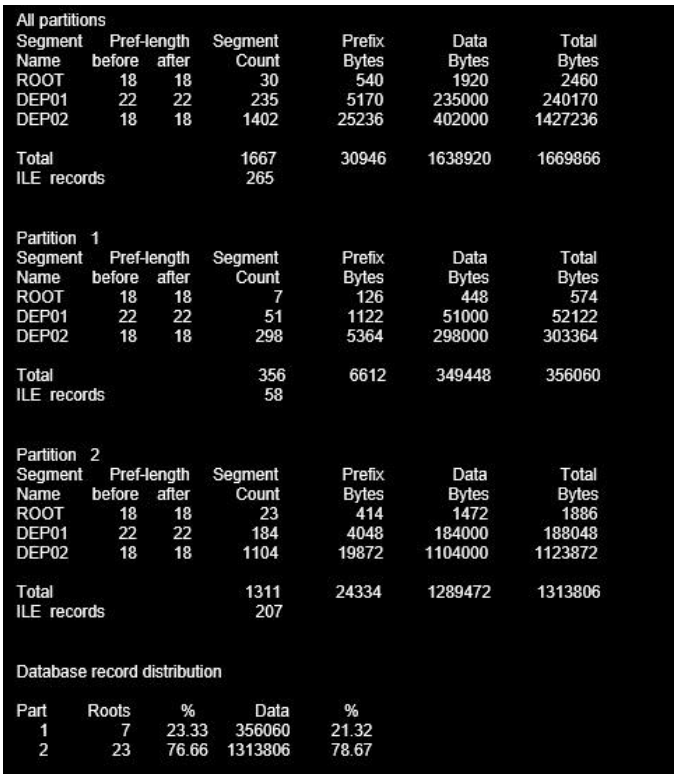


Figure 2: IMS HALDB Toolkit in the IMS Database Utility Solution

Maintaining IMS HALDB Databases

Once the IMS HALDB database is created and the data is migrated to it, the IMS DBA needs to maintain and tune it to ensure continued optimal performance. The *IMS HALDB Toolkit* provides a number of functions to help the IMS DBA maintain the IMS HALDB database. The tool allows the IMS DBA to consolidate or split partitions where the data is showing signs of growing or shrinking. An example of this can be seen in the Partition Selection Test Tool report is shown in Figure 3.



All partitions

Segment Name	Pref-length before	Pref-length after	Segment Count	Prefix Bytes	Data Bytes	Total Bytes
ROOT	18	18	30	540	1920	2460
DEP01	22	22	235	5170	235000	240170
DEP02	18	18	1402	25236	402000	1427236
Total			1667	30946	1638920	1669866
ILE records			265			

Partition 1

Segment Name	Pref-length before	Pref-length after	Segment Count	Prefix Bytes	Data Bytes	Total Bytes
ROOT	18	18	7	126	448	574
DEP01	22	22	51	1122	51000	52122
DEP02	18	18	298	5364	298000	303364
Total			356	6612	349448	356060
ILE records			58			

Partition 2

Segment Name	Pref-length before	Pref-length after	Segment Count	Prefix Bytes	Data Bytes	Total Bytes
ROOT	18	18	23	414	1472	1886
DEP01	22	22	184	4048	184000	188048
DEP02	18	18	1104	19872	1104000	1123872
Total			1311	24334	1289472	1313806
ILE records			207			

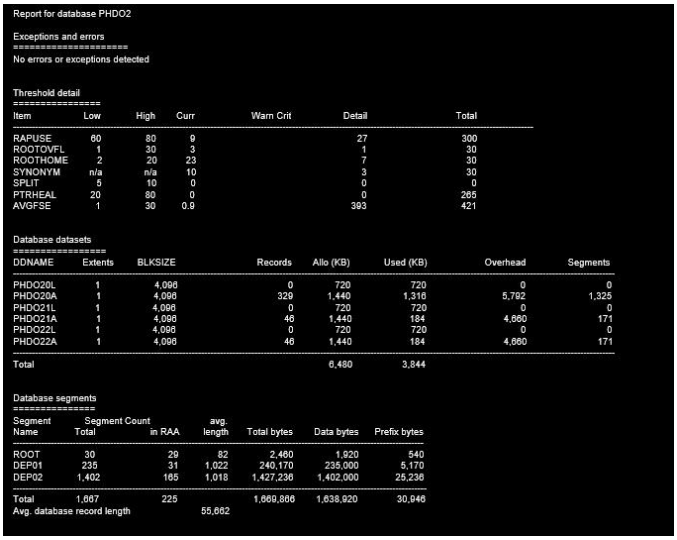
Database record distribution

Part	Roots	%	Data	%
1	7	23.33	356060	21.32
2	23	76.66	1313806	78.67

Figure 3: IMS HALDB Toolkit Partition Selection Test Tool Report

To ensure the new partition settings are correct, the tool allows the IMS DBA to simulate the repartitioning before actually making the change to the IMS HALDB database. In fact, the tool allows the IMS DBA to set specific thresholds to inform them when maintenance is required for an IMS HALDB database.

The *IMS HALDB Toolkit* creates a number of informative reports including the multi-page IMS HALDB Analyzer report. An example of the first page of this report is shown in Figure 4.



Report for database PHDO2

Exceptions and errors
No errors or exceptions detected

Threshold detail

Item	Low	High	Curr	Warn Crit	Detail	Total
RAPUSE	60	80	9		27	300
ROOTOVFL	1	30	3		1	30
ROOTHOME	2	20	23		7	30
SYNONYM	n/a	n/a	10		3	30
SPLIT	5	10	0		0	0
PTRHEAL	20	80	0		0	265
AVGFSE	1	30	0.9		393	421

Database datasets

DDNAME	Extents	BLKSIZE	Records	Allo (KB)	Used (KB)	Overhead	Segments
PHDO20L	1	4,096	0	720	720	0	0
PHDO20A	1	4,096	329	1,440	1,316	5,792	1,325
PHDO21L	1	4,096	0	720	720	0	0
PHDO21A	1	4,096	46	1,440	184	4,660	171
PHDO22L	1	4,096	0	720	720	0	0
PHDO22A	1	4,096	46	1,440	184	4,660	171
Total				6,480	3,844		

Database segments

Segment Name	Segment Count Total	in RAA	avg. length	Total bytes	Data bytes	Prefix bytes
ROOT	30	29	82	2,460	1,920	540
DEP01	235	31	1,022	240,170	235,000	5,170
DEP02	1,402	165	1,018	1,427,236	1,402,000	25,236
Total	1,667	225		1,669,866	1,638,920	30,946
Avg. database record length			55,662			

Figure 4: IMS HALDB Toolkit Analyzer Report (Page 1 of 6)

The *IMS HALDB Toolkit* provides a number of functions to improve the performance of IMS HALDB databases. For instance, once an IMS HALDB primary database is reorganized, all secondary index pointers require healing. In IMS, this healing process is performed using "self-healing" which means the index is corrected when it is first used. However, since the self-healing procedure can impact performance during peak times, the *IMS HALDB Toolkit* provides an offline utility to heal the secondary indexes. The *IMS HALDB Toolkit* can also assist in the conversion of user-partitioned IMS databases to IMS HALDB databases. If there are multiple identical databases with different key ranges, the *IMS HALDB Toolkit* will transform the databases into IMS HALDB databases and merge the data into a single IMS HALDB database. This can help users who need secondary indexing but were restricted from using it when the data was split across multiple databases.

Special IMS DBRC Handling

IMS HALDB databases are defined in IMS DBRC so the *IMS HALDB Toolkit* provides special functions to deal with IMS DBRC. For example, the tool allows the IMS HALDB DBRC definitions to be cloned or replicated from one IMS RECON data set to another IMS RECON data set. It provides the ability to change the high-level data set qualifier name during the replication process. The *IMS HALDB Toolkit* allows a set of production IMS HALDB databases to be allocated and copied from one IMS system to another IMS system.

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

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