



HALO™

 **NEON**
Enterprise Software, Inc.

product overview

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HALO: High Availability, Low Outage

Availability of online data has become increasingly critical in a 24x7 global marketplace. With HALO and HALO/FP, database conversions and structure changes can be implemented while online IMS applications continue to run seamlessly. Outages are reduced from hours to just seconds.

The volume of transactional data continues to double annually, pushing IMS database capacity to its limits. IMS database conversions, such as converting from non-partitioned to partitioned databases, are often required to satisfy demands for real-time access to a growing body of transactional data. With HALO and HALO/FP, virtually any IMS database conversion or segment restructuring can be implemented without a significant outage.

The solutions use NEON Enterprise Software technology to capture online database updates from one database type and apply those updates to another database type—allowing you to keep critical applications online and operational. With HALO and HALO/FP, you do not have to trade performance for availability, you can have both.

Improving Performance Without Sacrificing Availability

The solutions offer a rich set of features that support superior database performance and capacity, while reducing costly delays and online application outages that can negatively affect business productivity. Using HALO and HALO/FP, you can ensure that your critical applications and databases are available while you:

- Convert a database to a different database type (HALO only)
- Restructure a database
- Make compression changes
- Implement tuning changes for a database

A Single Solution for All Types of Databases

HALO is the solution for all of your full function needs. HALO/FP provides the functionality listed for your Fast Path databases (DEDBs).

<u>Solution</u>	<u>Type of Database</u>	<u>Changes Supported for the Type of Database</u>
HALO	Full Function	<ul style="list-style-type: none">• Convert a database to a different database type• Restructure a database• Make compression changes• Implement tuning changes for a database
HALO/FP	Fast Path	<ul style="list-style-type: none">• Restructure a database• Make compression changes• Implement tuning changes for a database

Automatically Recognizes Logically Related Databases

Converting or restructuring logically related databases is simple. HALO supports conversion of both internal (recursive) and external logically related databases. During the conversion process, HALO captures and applies updates for all logically related databases concurrently, allowing you to avoid multiple outages.

Takes the Guesswork Out of Conversions

In addition to logically related databases, you can specify DBRC:

- Database groups
- Change accumulation groups

You specify the name of one database in the group and the solution does the rest of the work for you by automatically identifying and processing all of the databases in the group concurrently.

Broad Choices for Conversions

HALO supports any combination of full-function databases conversion. For example, you can convert a non-partitioned database to NEON Enterprise Software's Partitioned Database Facility (PDF), or you can convert a non-partitioned database to a High Availability, Large Database (HALDB).

TYPE OF DATABASE YOU WANT TO CONVERT	DATABASES SUPPORTED FOR CONVERSION					
	HALDB	HDAM	HIDAM	HISAM	PDF	SHISAM
HALDB	N/A	✓	✓	✓	✓	✓
HDAM	✓	N/A	✓	✓	✓	✓
HIDAM	✓	✓	N/A	✓	✓	✓
HISAM	✓	✓	✓	N/A	✓	✓
PDF	✓	✓	✓	✓	N/A	✓
SHISAM	✓	✓	✓	✓	✓	N/A

Supported Database Restructuring Changes

During the conversion, you can make structure changes (such as restructuring segment data and adding new search fields), implement hardware data compression, and make tuning changes.

These are a few examples of the many structure changes that can be made using HALO and HALO/FP.

- Increase and decrease fixed or variable-length segment size
- Add and delete data set groups
- Add and delete indexes (as long as HALO does not capture any updates using the obsolete index)
- Add new segments when existing segment parentage is not altered
- Add new search fields
- For Fast Path databases, make area changes (such as change one area to two)

Range of Supported Compression Changes

The solutions can also be used to make compression changes. For example, HALO can:

- Implement hardware data compression (HDC)
- Change from a different compression method to HDC
- Re-evaluate the HDC dictionary for existing compression exits
- Remove segment compression

Secure Recovery Process

In addition, temporary RECON data sets that can be used for the database conversion or restructuring process are created automatically. Should any problem arise, your production RECON data sets and databases remain unchanged, allowing for uninterrupted online transaction processing.

Easy to Install—Easy to Manage

Installing a solution is simple and straightforward. An easy-to-use ISPF interface speeds implementation, while allowing you to manage HALO and HALO/FP from a central location. Default values are provided in most cases, so that you can begin using a solution immediately.

Customization of a solution or any of its components is easy. With a few keystrokes, you can quickly generate all of the JCL you need to incorporate HALO into your conversion process. HALO also produces reports with detailed information about every step in the HALO conversion process.

Process Overview

HALO and HALO/FP creates shadow copies for use with the process and uses its Data Collection Facility (DCF) to accumulate online updates to the database.

After the database conversion or restructuring is complete, HALO and HALO/FP analyze the changes made to the database, and the Database Collection Facility (DCF) converts the captured database updates as needed, and applies them to the new database structure with a minimal database outage—just long enough to rename data sets and put the new databases back into service. IMS applications remain online and available throughout this process.

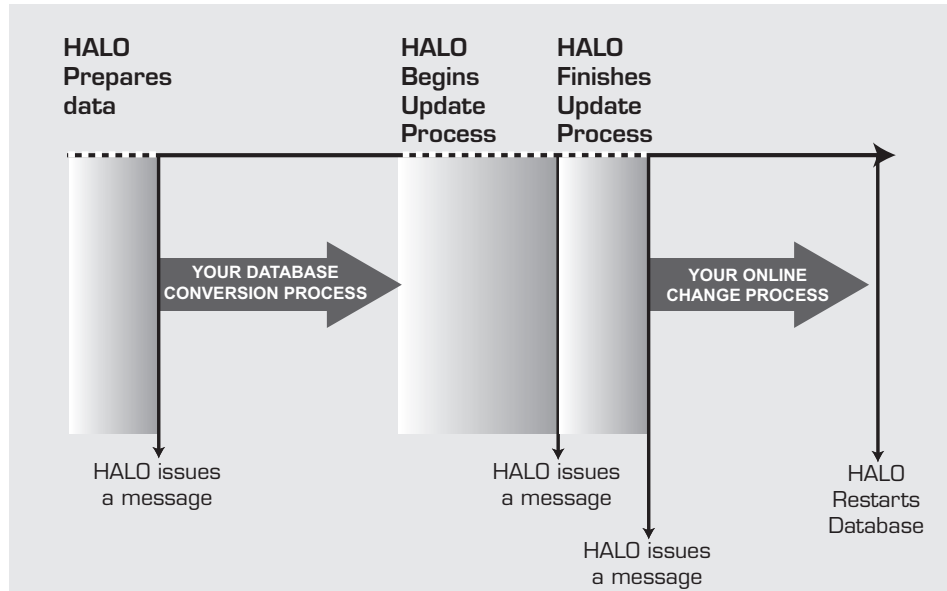
Options to Meet Your Needs

HALO and HALO/FP provide more than one method so that you can select the method that suits your needs. The table provides a brief description of the methods available.

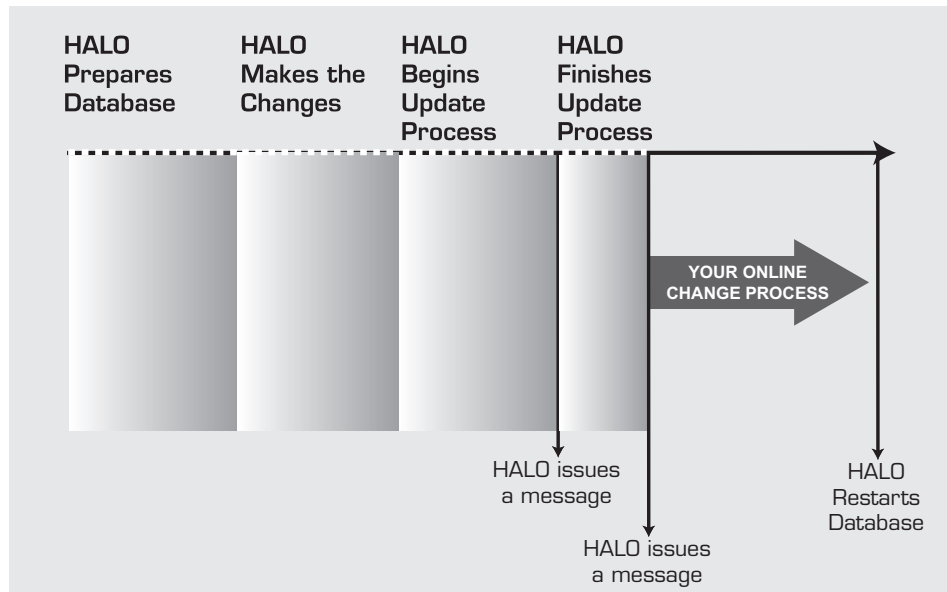
Option	Variations in the Process	Changes You Can Make Using the Method
Use HALO to manage the databases while you implement your changes	You develop and test your own change process and HALO keeps the database online while you implement the change.	<ul style="list-style-type: none">• Convert a database to a different database type• Implement HDC or make other compression changes• Restructure a database• Implement tuning changes for a database
Use HALO to make the changes	HALO makes the change and HALO keeps the database online while it implements the change.	<ul style="list-style-type: none">• Implement HDC or make other compression changes• Restructure a database

Options and the Process

The illustrations show the process for the 2 options for using HALO and HALO/FP.



HALO and HALO/FP Manage the Databases



HALO and HALO/FP Make the Changes

Additional Features

In addition to assisting with the conversion or restructuring process, HALO and HALO/FP provide easy-to-use administrative and reporting features. The table below lists some of the administrative and reporting tasks that you can perform with the easy to use ISPF interface.



CATEGORY	TASKS THAT CAN BE PERFORMED
If you have a license for Persist, manage Persist enabled jobs	<p>For your convenience, HALO and HALO/FP contains customizable parameters and menu options for using Persist. If you have a license for Persist, you can:</p> <ul style="list-style-type: none"> • Specify the customizable parameters that become the defaults for the Persist enabled jobs • Change the customizable parameters using the HALO Management Interface • Manage the Persist enabled jobs (For example, you can terminate, suspend, resume, and control the frequency of the checkpoints in IMS BMP, DLI, and DBB batch jobs.)
Perform administrative tasks	<p>Enable or disable DCF</p> <p>Locate and review the reports that HALO and HALO/FP create during the change process</p>
Review reports, troubleshoot problems, and correct errors	<p>Locate detailed information about the messages that are displayed and generated in the reports</p> <p>When a problem occurs with a PSB or DBD, disassemble the PSBs and DBDs</p> <p>When requested by NEON Enterprise Software Technical Support, display a list of fixes applied to the release so that you can provide information about the fixes.</p> <p>When requested by NEON Enterprise Software Technical Support, display a list of modules in a library so that you can locate any problem areas.</p>

Limitations for HALO

While HALO supports all combinations of full function conversions, it does not support:

- Altering existing search or key fields
- Altering segment parentage

The Cost Advantage

With HALO and HALO/FP, you can verify and perform database conversions or restructuring, while significantly reducing outages and avoiding unnecessary costs.

Determining the Costs of Outages

Converting or restructuring a large database can be costly when an outage affects critical business applications. If something goes wrong, the costs may include not only the cost of the outage itself—plus the time spent on the conversion process, but also lost business opportunities, revenue, and customers. In most industries, an outage that lasts hours can mean millions of dollars in lost revenue and productivity. The table below shows the cost-per-hour of outages in various types of industries.

INDUSTRY	COST PER HOUR OF AN OUTAGE IN MILLIONS
Banking	\$1.4
Credit Card Sales	\$2.6
Insurance	\$1.2
Manufacturing	\$1.6
Telecommunications	\$2.0
<i>Average of the 5 listed industries</i>	\$1.76

Example Worksheet

In the example worksheet below, it is estimated that a traditional conversion will take 8 hours (28,800 seconds), and the outage will be equal to the length of the conversion. Using HALO, the conversion will continue to take the same amount of time, but the length of the actual outage will be only 30 seconds.

Worksheet: Calculating HALO Cost Advantage		
Outage without HALO in seconds		28,800.00
Outage with HALO in seconds	-	30.00
Total outage without HALO in seconds	=	28,770.00
Seconds per hour	÷	3600.00
Total outage without HALO in hours	=	7.99
Cost per hour for an outage	x	\$ 1.76
Cost advantage of using HALO in \$ millions	=	\$ 14.06

The following worksheet can be used to determine the cost savings that can be realized with HALO. In the worksheet, the cost savings are calculated using an increase in availability that can be realized with HALO.

Worksheet: Calculating HALO Cost Advantage		
Outage without HALO in seconds		
Outage with HALO in seconds	-	
Total outage without HALO in seconds	=	
Seconds per hour	÷	3600.00
Total outage without HALO in hours	=	
Cost per hour for an outage	x	\$
Cost advantage of using HALO in \$ millions	=	\$

<i>Outage without HALO in seconds</i>	This value represents the estimated outage, in seconds, that occurs when performing a traditional conversion without HALO. It will reflect the amount of time that the database is unavailable while the conversion is taking place. In most cases, this value will be in hours and must be multiplied by 3600 (seconds per hour).
<i>Outage with HALO in seconds</i>	This value represents the estimated outage, in seconds, which will occur when HALO is used. During the conversion, the database is available along with the applications updating the database. A momentary outage occurs while HALO applies the updates and waits for you to complete the online change. In many cases, this value is just a matter of seconds.
<i>Total outage without HALO in seconds</i>	This value represents the total outage, in seconds, which will occur when HALO is not used during the conversion.
<i>Seconds per hour</i>	This value converts the number of seconds to hours.
<i>Total outage without HALO in hours</i>	This value represents the total outage in seconds, converted to hours.
<i>Cost per hour for an outage</i>	This value represents the cost of an outage per hour in \$ millions. If you do not have a value available, you can use \$1.76 million as an average industry cost-per-hour.

Product Requirements

- IBM-supported version of z/OS (64-bit mode required)
- IBM-supported version of IMS
- DFSMSdss V1.5 or higher, or Fast Dump Restore version 5.3 level 22 or higher
- DFSORT V1.1 or later or an equivalent SORT product
- NEON Enterprise Software Eclipse iCopy V5.1.2 or later

NEON Enterprise Software Products

NEON Enterprise Software offers a variety of solutions to increase and maintain data availability for your mainframe enterprise. Every NEON Enterprise Software solution is architected to work smarter than other offerings, not just faster, providing the highest levels of control and availability for your applications and infrastructure.

Eclipse Backup and Recovery Utilities

The Eclipse Backup and Recovery Utilities provide a solution for all types of IMS database recovery: point-in-time, full database recovery, and disaster recovery.

Database Director™ and Database Director/FP™

Database Director and Database Director/FP enables online reorganizations of all types of IMS full function databases without requiring an application outage. While reorganizing an online database, Database Director and Database Director/FP can also perform other database tasks such as cloning, space allocation, tuning, restructuring, and facilitating hardware data compression.

Eclipse iExtract™

Eclipse iExtract is a powerful utility that quickly and efficiently extracts data from both IMS full-function and Fast Path databases. Because Eclipse iExtract directly accesses the database, its performance is unmatched.

Eclipse iLM™

Eclipse iLM provides an affordable, comprehensive set of tools for cleaning and maintaining IMS and CICS libraries, including ACB, DBD, PSB, and dynamic allocation libraries, DBRC, and the DFSDDIR member of MODBLKS. By verifying that IMS-related libraries are in sync with one another, Eclipse iLM ensures database integrity and availability.

Eclipse iRepair™

Eclipse iRepair is a powerful tool for viewing, analyzing and repairing IMS database data sets and other z/OS data sets. You can use iRepair to resolve pointer check errors or other types of data errors, reducing the amount of maintenance required to back out and restore problem database data sets.

Eclipse Reorganization Utilities™

The Eclipse Reorganization Utilities are the fastest IMS reorganization utilities available. These IMS database utilities include Eclipse iBuild, Eclipse iCheck, Eclipse iCopy, Eclipse iLoad, Eclipse iSurvey, and Eclipse iUnload, all of which can be used standalone or as an integrated solution.

Lightning Utilities

The NEON Lightning Utilities increase database availability by providing space management and optimization solutions to expand capacity and increase the time between reorganization for Fast Path DEDB databases. Lightning DEDB optimizes independent overflow (IOVF) free-space searches, Lightning Reclaim improves DEDB performance by performing selective IOVF free-space reclamation through a methodical analysis of UOWs using SMAP information. Lightning Extend utilities reduce business risk by responding immediately to capacity problems so that applications remain available at all times. Lightning X lets you create secondary indexes for your Fast Path DEDBs, providing a set of easy-to-use utilities to build, verify and maintain the indexes.

Mission Control™

Mission Control is an intelligent IMS data management console that allows you to monitor and control all of the IMS full function and Fast Path databases in your enterprise. Mission Control automates database monitoring and problem resolution, enabling service-level agreements to be easily met.

Online Reorganization Director™ and Online Reorganization Director/FP

If you are using IBM HP utilities, Online Reorganization Director and Online Reorganization Director/FP provide 100% application availability during reorganizations—plus seamless integration with IMS High Performance utilities.

Partitioned Database Facility™

Partitioned Database Facility increases IMS database capacity and improves database performance and availability, providing a cost-effective method for growing your business without affecting business applications.

Prefix Update™

Prefix Update performs prefix resolution and prefix update operations in a single job step, making the process faster and more efficient than with other solutions.

DB2 Products

Partnering with Software Engineering GmbH, NEON Enterprise Software presents a comprehensive set of solutions to improve and maintain DB2 database and application performance. The following products are available to serve the DB2 enterprise. To fully explore how NEON Enterprise Software DB2 products can help you better control your DB2 environment and improve database availability, visit www.neonesoft.com/db2.shtm.

iServe™ Managed Services

iServe managed services for IMS gives you the opportunity to extend your IMS expertise by providing needed services to your organization. To fully explore how NEON Enterprise Software can supplement your IMS staff and expertise, visit www.neonesoft.com/ISV.shtm.

About NEON Enterprise Software

NEON Enterprise Software is the technology leader in enterprise data management software and services. As the rules of business change, our solutions let you efficiently control, protect, retain and manage data to comply with today's business and legal requirements. Founded in 1995, NEON Enterprise Software serves customers worldwide with its dedicated team of industry experts. For more information about NEON Enterprise Software, visit www.neonesoft.com or call 281.491.6366 or 888.338.6366.

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