



Database Director™



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Take Control of Database Maintenance and Application Availability

In today's fast-paced business environment, applications must be available and online whenever customers need them—even during IMS database reorganizations.

Database Director and Database Director/FP are high performance solutions that reorganize IMS databases and automate IMS database maintenance and online reorganizations while providing 100% application availability.

Database Director/FP includes all of the rich functionality of Database Director and fully supports read-only and online reorganizations for Fast Path databases (DEDBs). Using Database Director/FP, you can reorganize DEDB areas or the entire DEDB database.

Flexibility, Speed, and Power

The solutions use NEON Enterprise Software Eclipse Reorganization Utilities™ to enable rapid, intelligent reorganizations for both online and offline databases. The Eclipse Reorganization Utilities utilize IBM System z9 Integrated Information Processors (zIIPs). By moving eligible work to zIIPs, the utilities free up central processors and reduce the overall cost of computing. For example, as much as 97% of the processing required to build an index can be moved to zIIPs.

By executing operations concurrently and requiring only one pass of the database, Database Director conserves valuable resources. The result is reduced CPU and elapsed time for reorganizations—anywhere from one-half to one-third that of competing products.

Reorganizations—Tailored to Your Needs

High availability is combined with flexibility, providing a comprehensive solution that suits any of your database reorganization and application availability needs. You choose the reorganization mode that best suits your needs based on the level of availability you need. Four reorganization methods are provided:

Persist—Maximizes database and application availability. Persist manages the IMS BMP, DBB and DLI batch jobs so that there is no application downtime during the reorganization process. Once enabled, you can also use Persist to suspend and resume applications for any task you choose. Since applications are not terminated, connections remain intact, and restarts are avoided. Persist also includes a utility that you can use to dynamically enable Persist in all of your IMS BMP, DLI, and DBB batch jobs so that implementation is effortless.

Online—Assures both database availability and update capability. Online assures databases are online and available for update, while you manage the momentary outage to complete the reorganization process.

Read-Only—Maintains the availability of databases that do not require update capability during the reorganization process. The database remains online and in read-only mode. You manage the momentary outage to complete the reorganization process.

Batch—Manages the reorganization process for offline reorganizations. Potential errors can be eliminated by using Batch to automate the steps associated with the batch reorganization.

Reliable Cloning—No Waiting, No Outage

Copies can be created up to 80% faster than with a traditional image copy restore process—without having to wait for a batch window or taking the database offline. The database is always online and available for update.

The solutions eliminate the need to stop online transaction processing in order to obtain a clean copy of an online database, and it eliminates the subsequent database restore and forward recovery normally required to obtain copies of online databases.



Solutions for All of Your IMS Databases

Database Director supports full function, HALDB, PDF, and Fast Path databases (DEDBs) in batch while Database Director/FP provides a solution for all of your read-only and online reorganization needs for Fast Path databases (DEDBs).

TASK YOU WANT TO PERFORM	TYPE OF DATABASES								
	DEDB	HALDB	HDMA	HIDAM	HISAM	INDEX Only	SHISAM	PDF	LOGICAL
<i>Clone a database:</i>									
Clone an online database that is being updated	✓	✓	✓	✓	✓		✓	✓	
Clone an online database that is being updated without terminating the IMS BMP, DLI, and DBB jobs	✓	✓	✓	✓	✓		✓	✓	
<i>Reorganize a database:</i>									
Reorganize an offline database in batch	✓	✓	✓	✓	✓		✓	✓	✓
Reorganize an offline database that is read-only	✓	✓	✓	✓	✓		✓	✓	✓
Reorganize an online database that is read-only without terminating the IMS BMP, DLI, and DBB jobs	✓	✓	✓	✓	✓		✓	✓	✓
Reorganize an online database that is being updated	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reorganize an online database that is being updated without terminating IMS BMP, DLI, and DBB batch jobs	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reorganize an online database that is being updated and generate the control cards that NESI Eclipse iRecover can use to create an incremental image copy	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reorganize an online database that is being updated and generate the control cards that NESI Eclipse iRecover can use to create an incremental image copy without terminating IMS BMP, DLI, and DBB batch jobs	✓	✓	✓	✓	✓	✓	✓	✓	✓

Supports Logically-Related Databases

All internal and external logical relationships are included in the reorganization process. You specify one database in the relationship, and all related databases are automatically identified and included.

Logically related databases—both internal and external—can be cloned concurrently. For HALDB databases, the process is simplified considerably. With one name as input, not only are copies of the HALDB databases created, but also indexes and indirect list data set (ILDSS).

The solutions also generate the DBRC commands that can be used to register the new database data sets. Since DBRC commands are generated automatically, a clone can be created without the intervention of a database administrator. The indirect list data sets are cloned automatically. Output RECON data sets are created with the cloned database data set names registered.

product overview



Automatically Suspends and Resumes Jobs

Persist automatically suspends and resumes jobs during reorganizations and clones. You can also suspend and resume applications for a specific job, or for an entire database, for any task that you choose. For example, you can suspend and resume the jobs for a database so that you can make an image copy.

This powerful combination of options makes Database Director and Database Director/FP invaluable when performing any maintenance task where application availability is critical.

Reduces Workloads and Increases Productivity

While IT organizations are being asked to do more with less, batch windows continue to shrink. Meeting this challenge means doing more in less time. With Database Director and Database Director/FP, you can automate many of the tasks performed during reorganizations, executing them in a single step—with full database integrity. The result is increased availability and a simplified reorganization process that reduces errors.

Simplifies and Automatically Manages the Reorganization Process

The solutions generate all necessary control statements and perform all of the necessary reorganization tasks—automatically controlling and managing space requirements and creating the necessary data sets. Only the name of the database is required to perform a reorganization.

Common mistakes such as omitting the image copy after the reorganization, or omitting the prefix update before the image copy, are avoided completely. The integrity of the reorganization is assured because the following steps are done automatically:

- Takes all the necessary actions to maintain database integrity
- Generates all the required control statements and invokes the appropriate utilities
- Obtains image copies for all of the databases registered as recoverable in DBRC
- Performs a prefix update for all of the databases that are logically related
- Creates any primary and secondary indexes
- For online reorganizations, captures, collects, and applies updates
- If you have enabled Persist, automatically suspends and resumes IMS BMP, DLI, and DBB batch

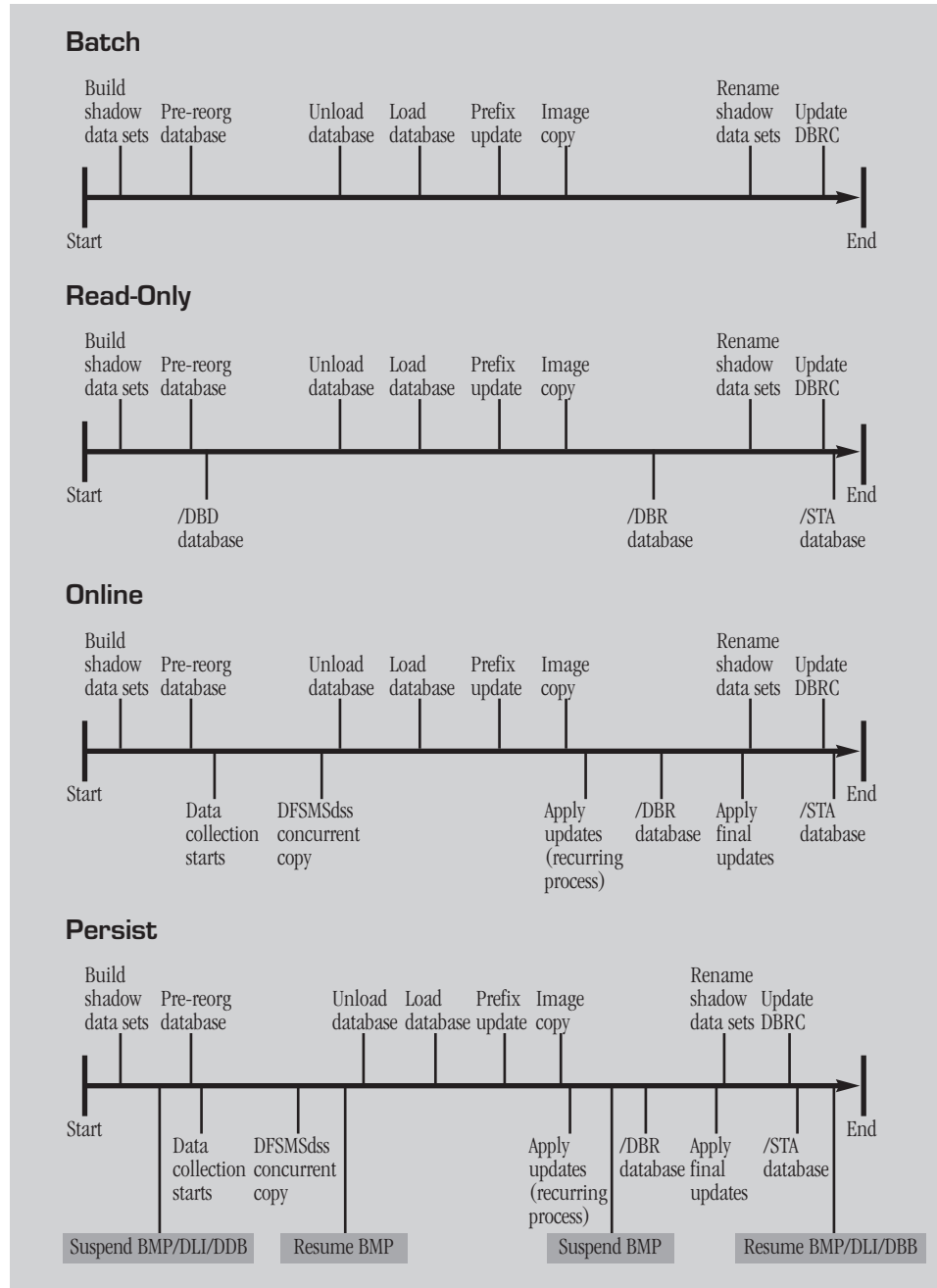
Supports Full Reorganizations—Plus Area and Partition Level Reorganizations

The solutions provide for full reorganizations, as well as reorganizations at the area and partition level.

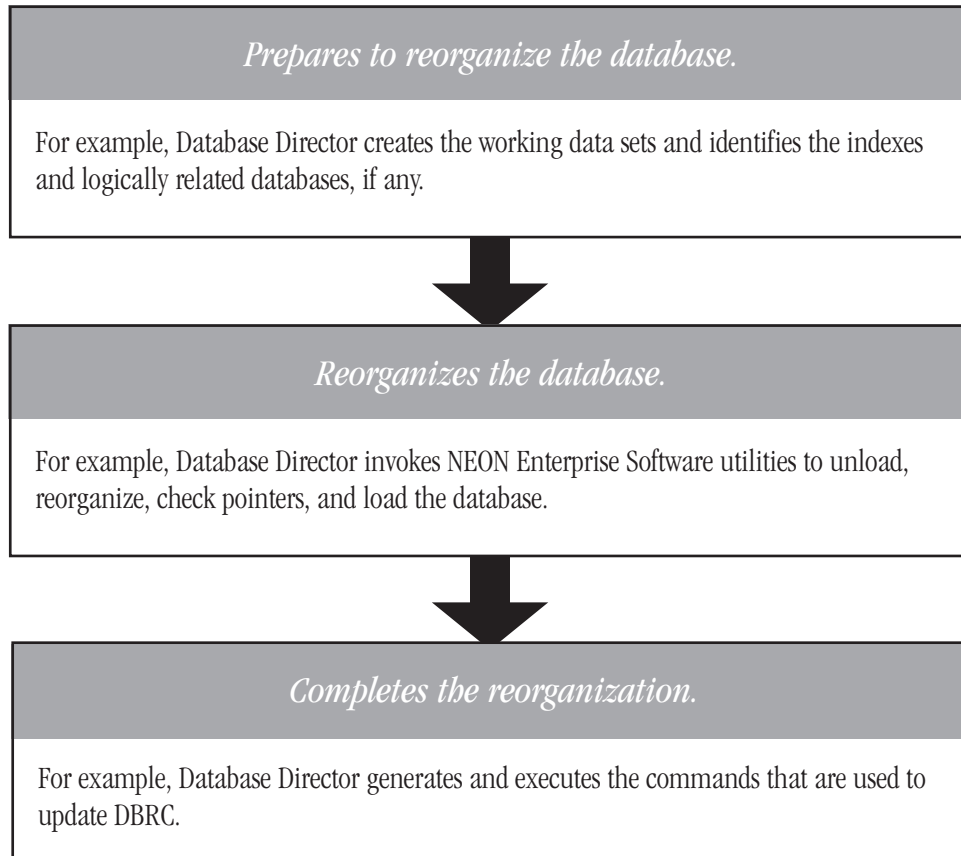
- For Fast Path (DEDB) databases, a specific area or areas can be reorganized.
- For HALDB databases without secondary indexes, a selected partition or multiple partitions can be specified.
- Clones can be created for entire databases or for specified areas in a Fast Path (DEDB) database.

Reorganizations: Process Overview

Whether you are reorganizing an online or offline database, the process is managed automatically, giving you the flexibility to choose the type of reorganization that best suits your business needs. The following illustration shows the various reorganization types available with Database Director and the steps associated with each type.



The general process is shown below.



The Advantage

Database Director and Database Director/FP are comprehensive solutions that make maintenance easy and provides quality and ease of use at every level—from installation to successful reorganization.

Easy to Install. Easy to Maintain. Even Easier to Use.

With the solutions, reorganizations can be performed using only the name of the database, and clones can occur using only the name of the database and the name of the copy.

IMS user modifications are not required to install the solutions. Furthermore, a solution is installed and maintained without an IMS control region outage. Once the quick and easy customization process is complete, the solutions are ready to use. The values specified during customization become the defaults.

It also includes a utility that you can use to implement Persist in your IMS BMP, DLI, and DBB batch jobs. You can have the utility dynamically modify the JCL in the jobs so that the JCL does not have to be modified manually. The utility provides an ISPF interface that you can use to specify the criteria and schedule that the utility uses to determine the jobs to modify.

Makes Every Feature Easily Accessible

It provides an easy-to-use ISPF interface containing options for everything from reorganizing a database to changing customization features. The interface automatically generates lists so that selections can be made quickly. You can select one or more options for all of the supported features. If a problem occurs, all of the research to correct the problem can be done without ever leaving the ISPF interface.

Determines What Needs to Be Done and Does It

After specifying customization parameters, only the name of the database is required to perform a reorganization. If the database is in a Database Recovery Control (DBRC) group or a Change Accumulation database group, you can specify the group name and all of the databases in that group are detected and reorganized automatically.

Manages the Process—So You Don't Have To

During reorganizations, Database Director and Database Director/FP dynamically allocate new databases and intermediate data sets. It creates the appropriate image copies automatically, while giving you the option to stack copies and create multiple image copies during the process.

Provides Checkpoint Pacing

Persist provides a checkpoint-pacing feature that can be tailored to suppress excessive checkpoints. It controls checkpoint frequency by eliminating excessive checkpoints based upon the minimum time interval since the last checkpoint, the minimum number of DLI calls issued since the last checkpoint, and the minimum number of DLI database updates since the last checkpoint.

This facility provides options for suppressing the checkpoints globally for all of the applications, or for individual applications whenever they are running.

Automatically Generates WTOR (Write to Operator with Reply) Commands

The solutions automatically generate IMS WTOR commands when you are ready to switch over to the new reorganized database. It coordinates the commands in the operational environment and assures that all necessary commands are successful before proceeding with the reorganization process.

The solutions also generate any DBRC commands required to complete the DBRC registration and back out any changes if a problem is detected.

Adapts to Environmental and Reorganization Requirements

Database Director and Database Director/FP provide flexibility in adapting to environmental requirements. For example, it:

- Creates image copies using the method you prefer (Fast Dump Restore or DFSMSdss)
- Supports SMS and non-SMS managed data sets
- Allows pattern data set names so that the names of data sets can be specified to meet site standards
- Provides an option to audit reorganizations before they are submitted
- Includes any additional options specific to the database type, such as functions specific to HALDB databases
- For online reorganizations, supports updates for CICS database control

Combines Data Availability and Database Adaptability

Unload user exits can be specified during a reorganization or clone to perform tasks such as extracting data or initializing fields. You can make randomizer changes, add, change, or delete segment fields, add and delete segments, and make many other structure changes as well. You no longer need to take a database offline to implement these types of changes.

Intelligently Manages Data Set Allocations

During reorganizations, data set allocations are automatically managed intelligently. While Database Director and Database Director/FP work easily in SMS managed environments, they provide many timesaving features in non-SMS environments. Rather than waste time finding available space across all volumes, they find the required space on the volumes you specify. Volumes can be specified individually by unit or by SMS storage class.

For database data sets, a percentage of unused space can be specified. For OSAM and VASM databases, they assure that at least one candidate volume is available, and it does not add candidate volumes if the data set has guaranteed space.

Facilitates Planning for Capacity Changes

The solutions facilitate planning for changes in capacity demand by providing options for increasing the:

- Allocation by a specified increment, regardless of the amount used
- Primary and secondary allocations by a specific percentage

Once the amount of the anticipated change is specified, the solution performs all of the required space calculations.

Supports Online Reorganization of Indexes

The online reorganization of indexes is supported so that indexes can be rebuilt without having to reorganize the primary database. During the reorganization process, the solution copies the primary database data sets, rebuilds the requested indexes, and renames the databases, including copies of the primary database and any logically related databases.

Optimizes Performance with Work Load Manager

Database Director and Database Director/FP integrate with Work Load Manager (WLM) so that you can set differing performance goals for each database. Different service policies can be set for batch, read-only, and online reorganizations. With this capability, high-speed batch reorganizations make the most of valuable batch windows, and online reorganizations that consume few resources can run during business hours.

Automates Error Recovery

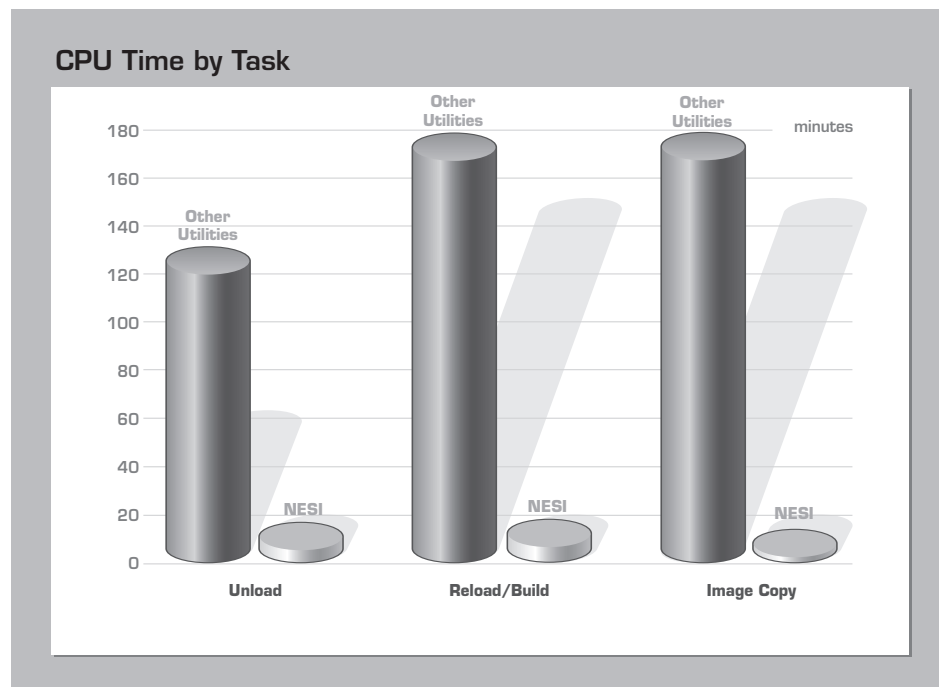
The solutions are self-monitoring with built-in error recovery checkpoints. Clean up is automatic after both successful and unsuccessful executions. Database Director automatically generates the commands needed to back out any changes it has made.

Performance and Speed You Can Count On

Using the power of the Eclipse Reorganization Utilities, the speed is unmatched. The Eclipse Reorganization Utilities execute operations concurrently and use only one pass of the database to perform multiple operations, reducing I/O and improving performance. In any mode, the solutions seamlessly integrate with the Eclipse Reorganization Utilities to obtain the best performance. By making choices that suit specific databases, each execution is customized and minimizes the impact on the system.

Reduced CPU Results in Real Cost Savings

The solutions can deliver a measurable return on investment. Using less CPU for reorganizations means more CPU is available for other uses, resulting in fewer MIPs—even when other utilities are already in place. In some environments, Database Director and Database Director/FP can pay for themselves in CPU savings alone.



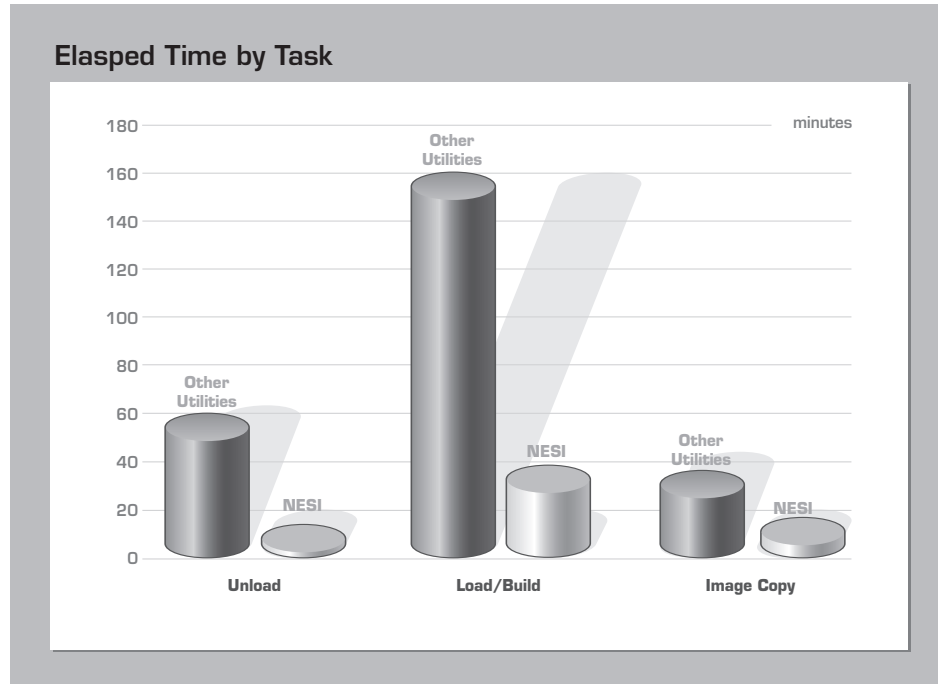
The Eclipse Reorganization Utilities further costs savings by utilizing the IBM System z9 Integrated Information Processor (zIIP) and Service Request Blocks (SRBs). Whenever possible, the Eclipse Reorganization Utilities perform processing on zIIPs and use SRB mode. The processing that the utilities move to the zIIPs helps to lower the cost of hardware, lower the cost of software, and can defer processor upgrades and corresponding software upgrade charges by freeing up existing central processing capacity.

Gets More Done in Less Time

While IT organizations are being asked to do more with less, batch windows continue to shrink. Meeting this challenge means doing more in less time. Database Director and Database Director/FP can do just that. The Eclipse Reorganization Utilities built into the solution run up to 50 times faster than traditional utilities and from six to 10 times faster than competing products; therefore, the elapsed time required for reorganizations is significantly reduced.

product overview





Integrates With Mission Control for Complete Automation

The solutions use Mission Control to store information about IMS databases and set thresholds that indicate when a reorganization is necessary. You can customize Mission Control monitors and thresholds to meet your site requirements for automated reorganizations.

Mission Control provides:

- Predefined thresholds for database management tasks
- Automation and scheduling execs
- E-mail notification of exceptions
- REXX exec automation
- A consolidated IMS console and IMS job log
- An interface to issue IMS and MVS commands
- A Windows client application to manage IMS databases through your internet or intranet

Mission Control provides a single control point for the NEON Enterprise Software IMS automation solution, giving you the ability to offload common maintenance tasks and free up DBA personnel for more complex projects. Use Mission Control with other NEON Enterprise Software products to automate database reorganizations, image copies, and other routine tasks.

Mission Control helps you to enforce established service level agreements by allowing you to automate maintenance activities and responses to problem situations. With Mission Control, you define your policies on database conditions and availability, and the protocols and methods used to resolve problems. Mission Control automatically executes maintenance activity based on your database availability requirements. Mission Control also provides an immediate response to problem conditions, preventing outages and improving database performance and availability.

Mission Control allows you to view IMS database and subsystem status and set performance thresholds based on best practices. You can also issue IMS, MVS, or Mission Control commands from the Mission Control console interface.

The Cost Advantages

In addition to saving money by maximizing DBA resources, Database Director and Database Director/FP prevent outages and minimize downtime that can cost a company millions. Using other products and utilities, the reorganization of a large database with indexes can take hours to complete. When data interrelationships exist, multiple databases may be required in order to process a single transaction. A reorganization of these databases can mean that an application is down until all of the databases are reorganized—further prolonging application downtime.

The solutions provide 100% application availability during a reorganization. Although the database is stopped for seconds during the dataset rename process and DBRC maintenance, the application program is not stopped. When the database is brought back online, the IMS application program is unaware that the database was reorganized and normal processing continues without interruption.

Determining the Cost of Outages

The following table shows common estimates for the cost of an outage in major industries. In most cases, industries and specific companies will have an estimated cost available. If an estimated cost is not available and your industry is not listed, \$1.76 million can be used as an average cost.

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

Worksheet: Examples of the Annual Cost of Outages

In the example worksheet, it is estimated that the current process or product for reorganizations and clones does not suspend or resume applications and that availability could be improved by .05. It also uses the average cost of outages for major industries which is \$1.76 million.

Availability Goal (%)	–	Current Availability (%)	×	Number of Hours in a Year	×	Cost Per Hour for An Outage In Millions	=	Cost Advantage in Millions
.99	–	.985	×	8760	×	\$ 1.76	=	\$ 77.088

By maintaining application availability and reducing downtime to seconds, Database Director and Database Director/FP not only makes the most of the company DBA resources, they can save the company millions.

Determining the Cost Advantages

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

Availability Goal (%)	–	Current Availability (%)	×	Number of Hours in a Year	×	Cost Per Hour for An Outage In Millions	=	Cost Advantage in Millions
	–		×	8760	×	\$	=	\$

- Availability Goal (%)* This value represents the availability goal that you are trying to achieve as a percentage. In most cases, it will reflect the savings you intend to gain by using Database Director and by removing the known outages that you can attribute to your current process or products.
- Current Availability (%)* This value represents the current availability of databases as a percentage.
- Number of Hours in a Year* This value represents the number of days (365) multiplied by the number of hours in a day (24).
- Cost Per Hour for An Outage* This value represents the hourly cost of an outage in millions.

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 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.

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.

product overview



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.

HALO™

HALO is a powerful new solution that provides near-continuous availability for IMS database partitioning and other restructuring. Online outages are reduced from hours to just seconds, allowing you to partition or restructure even the most critical databases without suffering long application outages that affect your business.

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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