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### Highlights:

- A backup and recovery solution that can help you achieve your business objectives for recovery
  - Able to perform targeted recovery based on application error
  - Includes storage-aware technology
  - Helps you to manage your DB2 for z/OS database with limited resources
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# IBM DB2 Recovery Expert for z/OS: a backup and recovery solution that helps protect critical data assets

The volume and complexity of data is increasing exponentially. This growth puts pressure on IT infrastructure, Service Level Agreements (SLAs) and system and personnel resources. In addition, over 90% of customers have more than one Database Management System (DBMS) to manage.

As businesses increasingly rely on data, are you as prepared as you can be for events that might cause data loss, interrupt your critical applications or even threaten the existence of your business? If an unforeseen event takes place and affects your data, how would that impact your business? And finally, what is the value to your staff and business to know that you have strategies in place that will allow you to recover data with minimal impact on availability?

## Reducing the timeline to recovery

The IBM® DB2® Recovery Expert for z/OS® can provide you and your business with a data insurance policy. Many organizations have critical programs that access DB2 for z/OS databases. Consider the situation where a critical batch program introduces an error that corrupts a table space and makes a recovery necessary. The situation is made more urgent due to the high priority of minimizing downtime and preventing negative consequences for application availability.

Without a solution such as the DB2 Recovery Expert, your staff may spend a significant amount of time solving the problem by:

- Determining the point of recovery
- Locating all affected objects, including all the tables that are DB2 managed and referential integrity (RI) related objects
- Creating the necessary recovery jobs
- Executing the recovery
- Validating that all the assets were recovered successfully



Most customers have a Recovery Time Objective (RTO) that they must meet to facilitate business continuity and satisfy existing SLAs. What if the above scenario occurred and you could not meet your RTO? How much would that cost your business in terms of time and money?

## Intelligent Recovery Manager

DB2 Recovery Expert can help you achieve your RTO, because it is designed to help your staff select the best method to recover your DB2 objects. The Intelligent Recovery Manager is a feature of DB2 Recovery Expert. It gives your staff the option to select a recovery plan based on a list of the available recovery points. The Intelligent Recovery Manager feature generates a list of recovery plans, which will automatically include all associated RI-related objects. Each item in the list of available recovery options is assigned a relative cost and ranked in ascending order. The list of recovery plans includes many different recovery techniques, including log analysis services that can be used to create undo-only or redo-only recoveries. The Intelligent Recovery Manager also generates the necessary jobs for each recovery plan. In addition, it is able to execute jobs in parallel when appropriate to save CPU resources and decrease downtime. The Intelligent Recovery Manager helps you ensure that all the recovery assets are present. This can increase the overall accuracy of the recovery, lead to a successful recovery experience and help you meet your RTO.

## Application versioning and recovery

DB2 Recovery Expert for z/OS also provides functionality for tracking object versions and data dependencies. Many customers have a complex DB2 for z/OS application development environment. There may be multiple non-production environments that are needed for testing, unit testing, development, quality assurance (QA), pre-production staging and other functions. These non-production environments may be designed to change continually, with multiple concurrent projects per application environment. Because of the iterative approach to development, there may be instances where DB2 schema changes will need to be “backed out,” or restored, to various versions of the table. For instance, you might encounter a situation where an application developer reports one of their changes was incorrect and needs to be backed out.

Backing out the changes to the pre-change schema version is a time-consuming manual process that is prone to error. Each time a changed is backed out, your staff must perform one or more of the following steps:

- Select the method of unload data: Unload/Load or DSN1COPY
  - If Unload/Load is chosen, either:
    - Unload from current base table
    - Unload from an image copy
- Drop the table
- Recreate the table without the changes that are being backed out
- Load data into the table either with the Load utility or DSN1COPY
  - If DSN1COPY is used, indexes need to be rebuilt
- Execute RUNSTATS on tables and indexes
- Recreate any additional dependent objects, such as synonyms and views
- Grant appropriate authorizations on the recovered objects
- Recreate RI
- Run CHECK utility to validate data integrity
- Recreate any associated triggers
- Bind packages that were invalidated

DB2 Recovery Expert has a versioning feature that can help users to maintain multiple versions of their DB2 objects. By using this versioning feature, users can more easily go back to a prior version of the object. An important aspect of versioning is the ability to restore authorizations to dropped objects. DB2 Recovery Expert is also able to recover a dropped object and automatically recreates the authorizations after restoration. This is extremely important if you need to back out a selected change in your application product environment without affecting availability. DB2 Recovery Expert automates several tedious and error-prone manual actions and helps you to get back to the correct consistency point of the application with minimal, if any, impact on availability.

## Storage-aware database tool

Consider the following scenario: you are executing over 1,000 traditional DB2 image copy jobs daily. In addition, you have a subset of tables that are critical to your business and must be image copied multiple times a day. What if you have a batch window in which to perform the image copies and as the table grows, the window shrinks? In this instance, the CPU use and time needed to complete the image copy are also growing along with the monthly operational resources needed to support the large number of expanding image copy datasets. What if your IT organization owns fast replication technology devices? How can a storage-aware database tool help you? A storage-aware database tool, such as Recovery Expert, provides functionality that can link and coordinate application and data management organizations with storage and business continuity administrators. The use of storage-based fast replication to perform traditional data management copy functions can help you to implement backup and recovery methods that are designed to simplify business continuity monitoring and transform tedious disaster recovery processes into more efficient disaster restart procedures.

A DB2 system level backup (SLB) method simplifies backup, recovery and disaster recovery procedures. Recovery Expert for DB2 can coordinate the database metadata and schema definitions with corresponding storage processor commands to help facilitate nonintrusive backup processes.

Storage-aware database utilities provide DB2 and storage processor coordination, which helps facilitate a DB2 for z/OS system-level backup method. System-level backup is both fast and easy compared to many other backup methods. For instance, in internal IBM testing, the IBM DS8000 was able to process 13TB in .5 seconds on one storage processor. The initial investment can be amortized through the resulting reductions of backup time, personnel involvement and CPU usage. This approach to backup can be especially useful for large application environments such as PeopleSoft or SAP.

Recovery Expert supports IBM FlashCopy®, EMC TimeFinder, STK and HDS ShadowImage facilities. Source and backup volume coordination and fast-replication commands are transparent to the Recovery Expert users.

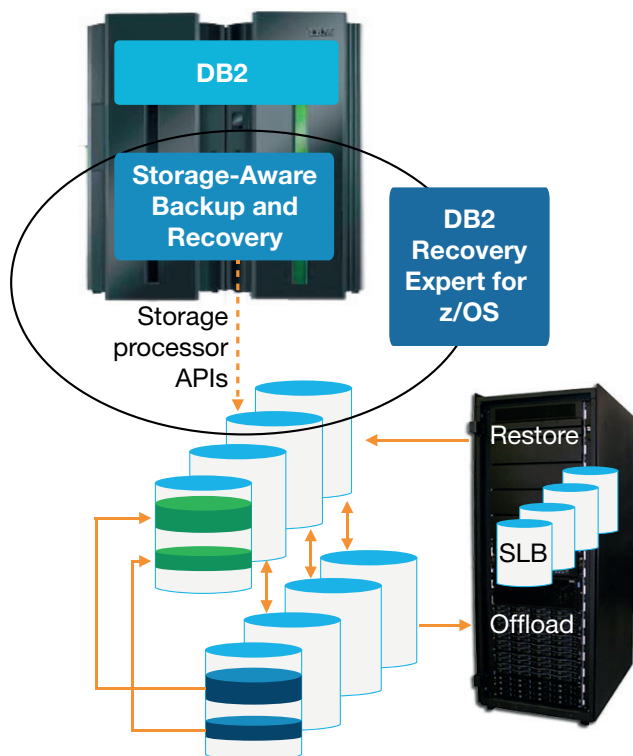
As a storage-aware database tool, Recovery Expert provides integration and coordination that can help you implement a fast and effective storage-based system-level backup.

## Ease of use

Recovery Expert is designed to be a self-managing solution that is also simple to use. It can improve staff efficiency by helping users of different experience levels back up and recover DB2 data. Users have a choice of interface, either Interactive System Productivity Facility (ISPF) or a web-based browser GUI. Both have the same functionality, look, feel and navigation, which can make it easier for users of any experience level to move between ISPF and GUI.

As shown above, left to right, the web-based browser client has several wizards:

- The Recovery Advisor wizard guides you through building recovery plans for any object data or data definition language (DDL). The result is a list of possible recovery plans with a cost associated to each one.
- The Log Analysis wizard helps you to find and store QUIET times based on a set of objects and store this information in the Recovery Expert repository for later use.





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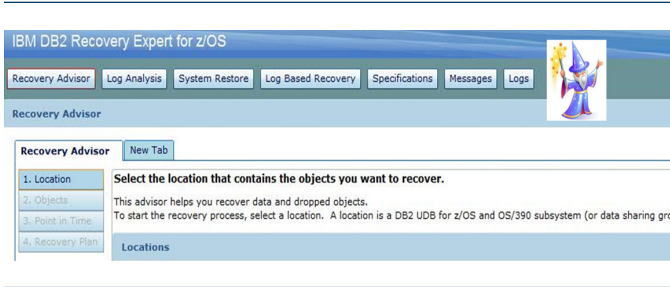
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May 2012  
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Please Recycle



### *Recovery Expert web-based GUI*

- The System Restore wizard helps you to build restore JCL by using any system level backup (SLB) that is supported by Recovery Expert.
- The Log Based Recovery wizard guides you through the steps of generating DDL and using the DB2 log files to recover dropped objects at a DB2 location.
- The Specifications wizard helps you build profiles of objects. These are similar to the BACKUP PROFILES in the ISPF version.

## Helping you achieve data protection and data availability

Many IT departments operate applications that involve both IBM IMS™ and DB2 relational database management system (RDBMS) assets. If disaster strikes, you need a recovery solution that can assist your coordinated recovery to a single point in time. The IMS Recovery Expert and DB2 Recovery Expert products are designed to provide a coordinated IMS and DB2 disaster recovery solution in which the two system environments are restored from a system-level backup and then rolled forward to a coordinated point in time.

When valuable data is at risk, your enterprise is exposed to the potential loss of critical business information, along with the associated disruption of business operations due to system downtime. While it is impossible to eliminate every data vulnerability, an intelligent backup and recovery plan that includes protection of your DB2 for z/OS data will help support your business continuity goals.

By investing in DB2 Recovery Expert for z/OS, you can more efficiently protect your daily operations and all inherent data center information, while implementing a strategy that can also help you avoid the problems that stem from data corruption and loss. DB2 Recovery Expert includes capabilities that can support quick, precise, cost-effective backup and recovery while helping enable dependable protection and high availability of your enterprise data.