

IMS Tools Red Note

IMS and DB2 for z/OS Coordinated Disaster Recovery



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Introduction

Performing disaster recovery of IMS and DB2 to a specific consistency point is complex and time consuming without tools and automation. This Red Note describes how to perform disaster recovery of IMS and DB2 to a consistent point-in-time using both IMS Recovery Expert and DB2 Recovery Expert.

IMS Recovery Expert and DB2 Recovery Expert Overview

IMS Recovery Expert for z/OS and DB2 Recovery Expert for z/OS are storage-aware backup and recovery solutions that integrate storage processor fast-replication facilities with IMS and DB2 backup and recovery operations. These IBM tools allow instantaneous backups, reduce recovery time, and simplify disaster recovery procedures while using less CPU, I/O, and storage resources.

IMS Recovery Expert and DB2 Recovery Expert provide a fast and easy-to-use implementation of an IMS and DB2 system backup and recovery methodology. A system-level backup (SLB) reduces backup windows by leveraging storage-based fast-replication such that backups of multi-terabyte databases can be performed with less than one second of outage for IMS and DB2. They simplify backup and recovery methodologies by allowing full-system, application, and database-level recoveries to be performed quickly and from a single system backup.

A system-level backup is a backup of the production volumes at a specific point-in-time. The backup can be transmitted to the remote site where it can be restored to create a complete IMS or DB2 system environment that includes the database data sets.

A system-level backup simplifies disaster recovery operations. It can be used to restart the database system at a point-in-time when the backup was performed or system-level backups can be rolled forward using available database logs at your disaster recovery site.

A system-level backup can be automatically offloaded from disk to tape or virtual tape for use at either the local or disaster site, or both. An encryption option provides security.

IMS Recovery Expert and DB2 Recovery Expert automate disaster recovery processes using a component called the Intelligent Disaster Recovery Manager. The Intelligent Disaster Recovery Manager automates both local and remote site restart and recovery procedures.

Intelligent Disaster Recovery Manager Overview

The Intelligent Disaster Recovery Manager is a component in both IMS Recovery Expert and DB2 Recovery Expert. It prepares the local recovery assets and also manages the restore, restart, and recovery operations at the remote site.

The Intelligent Disaster Recovery Manager “local site component” copies or identifies recovery assets such as IMS image copies, change accumulations and archive logs, and DB2 image copies and archive logs that will be used at the remote site. For IMS, it creates a backup of the RECON data set, and conditions it to reflect the recovery assets being sent to the remote site to allow for IMS to be rolled forward. For DB2, it creates a copy of the BSDS and conditions it to reflect the recovery assets being sent to the remote site to allow DB2 to be restarted and rolled forward. The Intelligent Disaster Recovery



Managers build all the JCL and control cards needed to restore, restart, and recover your IMS and DB2 at the remote site.

An IMS Recovery Expert or DB2 Recovery Expert Disaster Recovery Profile indicates to the Intelligent Disaster Recovery Manager what recovery assets should be copied to the remote site. Each product's disaster recovery profile is stored in its respective product repository.

The Intelligent Disaster Recovery Manager is run at the local site on a schedule that accommodates your Recovery Point Objective (RPO). Each time the IMS or DB2 Intelligent Disaster Recovery Manager local component is executed; jobs are rebuilt and placed in the disaster recovery (DR) PDS to be shipped to the remote site. The IMS Recovery Expert and DB2 Recovery Expert repositories are also backed up into the DR PDS so they can be reloaded for use at the disaster recovery site.

At the remote site, the DR PDS that contains all the JCL for the disaster recovery processing is restored. The Intelligent Disaster Recovery Manager "remote site component" restores the IMS Recovery Expert and DB2 Recovery Expert repositories, restores the system-level backup, and rebuilds the RECON and BSDS data sets. If coordinated disaster recovery between IMS and DB2 is not needed then the recovery of each DBMS can be done independently. For IMS, a roll forward recovery to the end of the last available archive log at the disaster recovery site is performed, and then the user can cold start IMS. For DB2, the user has to restart DB2 after the system restore and BSDS has been rebuilt to perform the roll forward recovery to the end of the last available archive log.

The next section will talk about how the Intelligent Disaster Recovery Managers can provide a coordinated IMS and DB2 disaster recovery.

Coordinated IMS and DB2 Disaster Recovery Overview

The IMS Recovery Expert and DB2 Recovery Expert products provide a coordinated IMS and DB2 DR solution where the two system environments are restored from a system-level backup and then rolled forward to a coordinated point-in-time.

Preparation for coordinated IMS and DB2 DR from the user's perspective is very similar to a regular DR. The user has to create backup profiles in IMS Recovery Expert and DB2 Recovery Expert and execute them to create SLBs for each of the participating subsystems. The IMS and the DB2 SLBs do not have to be done at the same time; they can be created independently. Users have to create a disaster profile in IMS Recovery Expert and DB2 Recovery Expert for each of the subsystems and select recovery options and recovery assets to be shipped offsite. To facilitate a coordinated recovery, each subsystem's disaster recovery profile must indicate the other subsystem as an "External Subsystem." The IMS Disaster Recovery profile should specify the DB2 subsystem name in the 'External Subsystem' field, while the DB2 Disaster Recovery profile should specify the IMS subsystem name in the 'External Subsystem' field. This tells IMS Recovery Expert and DB2 Recovery Expert that additional information about availability of recovery assets and SLB should be saved in a shared DR PDS.

Separate system-level backups are created for IMS and DB2, and respective archive logs are sent offsite, along with the shared DR PDS that was created by IMS Recovery Expert and DB2 Recovery Expert. At the remote site, IMS Recovery Expert and DB2 Recovery Expert will determine the most current common



recovery point between IMS and DB2 based on recovery information that went to the remote site. The system-level backup for each DBMS will be restored and the databases can be rolled forward using the archive logs to the common point-in-time *with only the committed updates* in both IMS and DB2 being recovered.

The remainder of this Red Note explains how to configure and use IMS Recovery Expert and DB2 Recovery Expert to achieve a common, transactionally consistent disaster recovery between IMS and DB2 systems.

Configuring IMS Recovery Expert and DB2 Recovery Expert

Steps 1 – 4 below are one time setup steps that only need to be performed when you configure IMS Recovery Expert and DB2 Recovery Expert for coordinated disaster recovery for your IMS and DB2 environments. IMS Recovery Expert and DB2 Recovery Expert system-level backups at your primary site will be driven by the information entered during the registration process, discovered during the system analysis and configuration process, and saved in the backup profile. If new data sets or new volume(s) are added to the IMS or DB2 environment after the backup profile is defined, a validation step in the system-level backup job will find the new volume(s) and attempt to automatically map it to an available target volume so that the new data sets or volume(s) are included in the backup.

1. Register IMS and DB2 systems.

- a. Register IMS systems in IMS Recovery Expert. Information is entered about your IMS systems such as the IMS subsystem ID, IMS started task name, IRLM task name, Resource Manager task name, Common Queue Server task name, and the data set name of the JES PROCLIB where the started task PROCs exists. This information enables IMS Recovery Expert to find all IMS data sets in your production IMS systems.
- b. Register DB2 systems in DB2 Recovery Expert. Information is entered about your DB2 systems such as the DB2 subsystem ID, ZPARMs member, Bootstrap data sets, loadlibs, and DB2 plans. This information enables DB2 Recovery Expert to find all DB2 data sets in your production DB2 systems.

2. Perform IMS and DB2 system analysis and configuration.

The IMS Recovery Expert and DB2 Recovery Expert tools each have a function to discover, analyze, and display information about the data sets for IMS and DB2 environments. IMS and DB2 data sets need to be on separate volumes from each other.

- a. IMS Recovery Expert, using the information supplied during subsystem registration, will find and display a list of all IMS system and database data sets, the volumes they reside on, and associated ICF user catalogs (required to be on volumes that will be backed up). An IMS system-level backup can include:
 - i. Active and archive logs
 - ii. RECON data sets
 - iii. All IMS database data sets



- iv. IMS system data sets (ex. ACBLIBs, SDFSRESL, RDS, etc.)
 - v. All associated ICF User catalogs
- b. DB2 Recovery Expert, using the information supplied during subsystem registration, will find and display a list of all production data sets, the volumes they reside on, and associated ICF user catalogs (required to be on volumes that will be backed up). A DB2 system-level backup can include:
- i. Active and archive logs
 - ii. Bootstrap data set
 - iii. All DB2 database data sets
 - iv. DB2 system data sets (ex. DB2 system catalog, DB2 directory, etc.)
 - v. All associated ICF User catalogs

An example of IMS system analysis is provided below:

Existing MVS User Catalogs used by this subsystem

Data	ICF.RSPLEX01.IMS.A3DB.CAT1	Volume	SIRB46
Log Sys Other	ICF.RSPLEX01.IMS.A3SYS.CAT1	Volume	SIRB43

IMS Recon Datasets

RECON # 1	IMSA3LOG.RECON1	Volume	SIRB45
RECON # 2	IMSA3LOG.RECON2	Volume	SIRB43
RECON # 3	IMSA3LOG.RECON3	Volume	SIRB44

Active Log Datasets

IAA3 - Prime	IMSA3EX.OLP00	Volume	SIRB42
IAA3 - Prime	IMSA3EX.OLP01	Volume	SIRB42
IAA3 - Prime	IMSA3EX.OLP02	Volume	SIRB42
IAA3 - Prime	IMSA3EX.OLP03	Volume	SIRB42
IAA3 - Prime	IMSA3EX.OLP04	Volume	SIRB42
IAA3 - Prime	IMSA3EX.OLP05	Volume	SIRB42
IAA3 - Second	IMSA3EX.OLS00	Volume	SIRB42
IAA3 - Second	IMSA3EX.OLS01	Volume	SIRB42
IAA3 - Second	IMSA3EX.OLS02	Volume	SIRB42
IAA3 - Second	IMSA3EX.OLS03	Volume	SIRB42
IAA3 - Second	IMSA3EX.OLS04	Volume	SIRB42
IAA3 - Second	IMSA3EX.OLS05	Volume	SIRB42
IAA3 - WrtAhd	IMSA3EX.WADS0	Volume	SIRB42
IAA3 - WrtAhd	IMSA3EX.WADS1	Volume	SIRB42
IAA3 - WrtAhd	IMSA3EX.WADS8	Volume	SIRB42

Alias used with associated MVS User Catalogs

IMSA3DB	ICF.RSPLEX01.IMS.A3DB.CAT1	Data
IMSA3EX	ICF.RSPLEX01.IMS.A3SYS.CAT1	Sys
IMSA3LOG	ICF.RSPLEX01.IMS.A3SYS.CAT1	Log Sys
IMSA3SYS	ICF.RSPLEX01.IMS.A3SYS.CAT1	Sys
IMSA4LOG	ICF.RSPLEX01.IMS.A3SYS.CAT1	Log Sys

Volumes used by this subsystem

Volume	Data	DCat	System	SysCat	Log	LogCat	Arc	ArcCat	Other
SIRB40	No	No	Yes	No	No	No	No	No	No
SIRB42	No	No	Yes	No	Yes	No	No	No	No
SIRB43	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes



SIRB44	No	No	No	No	Yes	No	Yes	No	No
SIRB45	No	No	No	No	Yes	No	Yes	No	No
SIRB46	Yes	Yes	No	No	No	No	No	No	No
SIRB47	Yes	No	No	No	No	No	No	No	No
Etc.									

3. Create IMS and DB2 backup profiles.

Backup profiles contain information that is passed to IMS Recovery Expert and DB2 Recovery Expert and incorporated into the backup job when it is built. The backup profile identifies the IMS system or DB2 subsystem, the fast-replication process to invoke to create the system backups, a pool of target volumes to use to create the system backups, the number of system backup generations to keep on disk or offloaded to tape, information on how to offload the system-level backups including encryption specifications, and how to create consistency when creating a system backup. The process of creating a backup profile consists of two phases: defining the profile through the IMS or DB2 Recovery Expert user interface; and then building the JCL to be used to create systems backups on some schedule.

Backup profile setup is a validation process performed by the Recovery Expert product and must be successfully completed before a backup of a system can be taken. This process authenticates the volumes for the system, checks the locations of the user data, logs, and user catalogs, and performs other validations to ensure the backup can be created and that the resulting backup will be usable for different recovery scenarios. Backup profile validation does the following:

- Ensures all volumes in use by the IMS/DB2 system are included in the backup.
- Ensures that the ICF user catalogs in use by the IMS/DB2 system are included in the backup.
- Ensures appropriate isolation of key data sets depending on backup method.
- Ensures that all source volumes are valid, online, and available for backup.
- Ensures all target volumes are valid and available for backup.
- Ensures volume location is appropriate for specified fast-replication.
- Verifies that target volumes are not in use by any other backup profile.
- Ensures that IMS Recovery Expert and DB2 Recovery Expert control information does not reside on any volume being backed up.

After the IMS and DB2 profile setup has been successfully completed, a “B” is entered next to the profile name to build the IMS and DB2 backup jobs. These jobs are added to a system scheduler and run as frequently as your recovery point objectives (RPO) dictate.

4. Create IMS and DB2 disaster recovery profiles.

The Disaster Recovery profile defines the recovery point to be used for remote site recovery and what recovery assets (Archive logs, Image Copies, etc.) will be sent to the remote site. The Disaster Recovery profile information is used during the processing by the local site DR preparation job.



At the local site, the user has to indicate to IMS Recovery Expert and DB2 Recovery Expert that the two subsystems should be recovered to a coordinated timestamp. This is done by selecting an “External Subsystem” on the DR profile update panel. The IMS DR profile should indicate the DB2 subsystem as an external subsystem, and the DB2 DR profile should indicate the IMS subsystem as an external subsystem.

The IMS and DB2 Intelligent Disaster Recovery Manager preparation jobs will build all the JCL and control cards needed for the IMS and DB2 recovery at the DR site into a DR PDS. The user must allocate the DR PDS before building the Disaster Recovery profiles. Both IMS Recovery Expert and DB2 Recovery Expert must use the same DR PDS as the data set into which the Intelligent Disaster Recovery Manager local site preparation job will create the jobs and control cards for the DR site recovery. The DR PDS will contain a copy of the RECON and BSDS as well as the JCL so it will need to be allocated with enough space to hold this data. The DR PDS must be sent to the remote site along with the other recovery assets.

When the preparation jobs are executed at the local site, IMS Recovery Expert and DB2 Recovery Expert will create additional members in the DR PDS to support the coordinated recovery.

The IMS and DB2 preparation jobs are also intended to be put into a scheduler to run each time a system backup is created with additional runs as frequently as your recovery point objectives (RPO) dictate.

Using IMS Recovery Expert and DB2 Recovery Expert to Prepare for a Disaster

This section reviews the following procedures:

- Create system-level backups
- Run the Intelligent Disaster Recovery Manager preparation job
- Transmit recovery assets to the remote site either via tape or replicated virtual tape

Create system-level backups

The system-level backup uses information defined in the backup profile to backup a complete database management system as a unit without affecting running applications. Information about the system-level backup and data backed up is recorded in a meta-data repository. IMS Recovery Expert and DB2 Recovery Expert should each have their own repository. The meta-data repository is used to record such information as database and table space characteristics and status at the time of system backup, information about the source and target volumes for a system backup, and offloaded system backups and on which tapes they can be found.

IMS Recovery Expert and DB2 Recovery Expert leverage fast replication to drive volume backups. To achieve an instantaneous backup with data consistency, there are two options:

- a. For IMS, IMS Recovery Expert internally suspends the IMS log updates for the milliseconds it takes to perform the backup. This process is called “IMS SUSPEND” and ensures all production



volume data is consistent. For DB2, DB2 Recovery Expert uses DB2's "DB2 SET LOG SUSPEND and RESUME" commands to ensure all production volume data is consistent. Both create a dependent write-consistent data state.

- b. The other option for both IMS and DB2 is to use a storage-based consistency function whereby all the volumes in a consistency group are frozen at the same time for the milliseconds it takes to perform the backup. This creates a dependent-write consistent data state.

The system-level backups are offloaded to tape or virtual tape for use at the remote site.

Run the Intelligent Disaster Recovery Manager preparation job

Run the Intelligent Disaster Recovery Manager preparation job after each system-level backup has been executed and each time you want recovery assets to be sent offsite. The Intelligent Disaster Recovery Manager preparation job generates all of the JCL and control cards needed to recover your IMS and DB2 system to the most current available timestamp at the remote site.

The IMS Recovery Expert local site component will perform the following:

- *Optionally* force an IMS system checkpoint.
- *Optionally* switch OLDS before copying archives.
- Copy image copies, change accumulations, and archive logs if an additional copy needs to be created for DR.
- Create a backup of the RECON data sets.
- Condition the backup of the RECON to indicate what image copies, change accumulations, and archive logs to use at the remote site.
- *Optionally* invoke the IMS Database Recovery Facility Extended Function HCHECK after creating the conditioned RECON.
- Create a copy of the IMS Recovery Expert repository and corresponding JCL to restore it and store it in the DR PDS.
- Create JCL to restore the system-level backup and store it in the DR PDS.
- Create JCL to recover all databases to the most current available timestamp and store it in the DR PDS.
- Copy the conditioned RECON and corresponding recovery JCL into the DR PDS.
- Create a tape pick list which can include the offloaded SLB, image copies, change accumulation, or archive logs to be used at the remote site.

The DB2 Recovery Expert local site component will perform the following:

- Copy archive logs if an additional copy needs to be created for DR.
- *Optionally* force a checkpoint before archiving.
- *Optionally* force the active log to archive.
- Create a conditioned BSDS to reflect logs sent to the remote site.
- Create a copy of the DB2 Recovery Expert repository and corresponding recovery JCL and store it in the DR PDS.
- Create JCL to restore the system-level backup and store it in the DR PDS.



- Create JCL to recover the entire DB2 system to the specified point-in-time and store it in the DR PDS.
- Copy the conditioned BSDSs and corresponding recovery JCL into the DR PDS.
- Identify DR image copies and build IDCAMS statements to catalog them. These statements are stored in the DR PDS which will be shipped to the DR site.

During the execution of the Intelligent Disaster Recovery Manager local site preparation job, IMS Recovery Expert or DB2 Recovery Expert will generate the same jobs and control cards that are generated for a non-coordinated IMS and DB2 DR. In addition, information to be used in determining a coordinated recovery point is also recorded in the DR PDS. This information includes:

- A timestamp of the highest archive log to be sent to the remote site.
- A timestamp of the SLB that was selected for restoring the system.
- If the subsystem is DB2, an indication of whether the system is data-sharing or not and the data set name of the DB2 Recovery Expert control file used by this system.
- Information on all earlier SLBs for the DB2 or IMS system in case coordinated DR determines it will have to fall back to an earlier timestamp.

Transmit recovery assets to the remote site either via tape or replicated virtual tape

This is a process performed outside of IMS Recovery Expert or DB2 Recovery Expert.

Using IMS Recovery Expert and DB2 Recovery Expert at the Remote Site

This section addresses the steps to recover IMS and DB2 at the disaster recovery site. The assumption is that a z/OS system has been recovered or is available at the DR site. Using IMS Recovery Expert and DB2 Recovery Expert, the process of performing a coordinated disaster recovery for IMS and DB2 at the DR site consists of restoring the DR PDS and then running the jobs contained in the DR PDS.

This section reviews the following procedures:

- Restore the IMS and DB2 DR PDS created at the local site
- Determine a common, consistent recovery point
- Perform system restore and recovery

Restore the IMS and DB2 DR PDS created at the local site

This is a step that must be performed by the user.

Determine a common, consistent recovery point

When disaster recovery processing is performed at the disaster recovery site, IMS Recovery Expert and DB2 Recovery Expert determine a common recovery point. After restoring the IMS and DB2 shared DR PDS, the first step of coordinated recovery is to run the JCL in member xxxx#JC0, where xxxx is the DB2 SSID.

This job will determine a coordinated recovery time for both IMS and DB2. The coordinated recovery time depends on the availability of SLBs and archive logs for IMS and DB2 at the DR site. The timestamps for the last IMS and DB2 archive logs at the remote site are analyzed to determine which occurred



earlier in time. This timestamp is used for the coordinated point-in-time recovery of IMS and DB2. When the participating DB2 is a data-sharing system, the common recovery timestamp will be exactly this timestamp (the lower of the highest available archives for IMS and DB2). This timestamp is then used to truncate the DB2 logs in a conditional restart and is used by IMS to perform point-in-time recovery of all databases.

If the participating DB2 is a non data-sharing system, additional processing will be necessary to determine a point-in-time that can be expressed both as a timestamp and as an RBA. Checkpoint and archive records in the DB2 BSDS will be examined to identify such a time.

When the DB2 archive log RBA that corresponds to the IMS archive log timestamp, the RBA is used to truncate the DB2 logs in a conditional restart while the matching timestamp is used by IMS to perform point-in-time recovery of all databases.

Once a consistent recovery point for IMS and DB2 has been determined, the additional jobs to restore and recover IMS and DB2 can be executed concurrently. The additional jobs to run to restore and recover IMS and DB2 are described in the next section.

Perform system restore and recovery

This section reviews the steps to restore and recover IMS and DB2.

To perform system restore and recovery for IMS:

- a. Run job xxxx#JC1 from the DR PDS. This job will:
 - Restore the IMS Recovery Expert repository. The repository contains information about the system-level backups.
 - Restore the IMS system from offloaded system-level backup.
- b. Run job xxx#JC2 from the DR PDS. This job will:
 - Delete and reallocate the IMS OLDS, WADS, and RECONS.
 - Delete and redefine GDG bases required for archive logs, image copies, or change accumulation data sets.
 - Issue IDCAMS RECATALOG commands to recatalog archive logs on tape.
 - Rebuild the RECON records from the DR PDS.
 - Uncatalog the tape archive logs. Copy the uncataloged tape archive logs to disk and catalog them.
 - *Optionally* verify that the assets needed for recovery are at the remote site.
- c. Run job xxxx#JC3 from the DR PDS.
This job will perform the forward recovery to recover all committed changes up to the common recovery time.
- d. Cold start IMS.

To perform system restore and recovery for DB2:

- a. Run job xxxx#JC1 from the DR PDS. This job will:



- Restore the DB2 Recovery Expert repository. The repository contains information about the SLB.
 - Restore the system-level backup.
 - Delete any existing DB2 log and BSDS data sets.
 - Define BSDS, Active Logs.
 - *Optionally* catalog all DR image copies.
 - Load the conditioned BSDS (contains information about all archive logs available at DR site).
 - Create a system point-in-time conditional restart record telling DB2 the RBA/LRSN of the common recovery time.
 - Print out a report with contents of the BSDS.
 - *Optionally* copy archive log data from tape to disk.
- b. (User step) Start DB2.
- c. (User step) Respond to WTOR allowing DB2 conditional restart.
- d. Run xxxx#JC2 from the DR PDS.
This job will perform a DB2 system recovery. Logs will be applied at the DR site to bring the entire DB2 to the common recovery time. Only one pass of the log is needed whereas traditional DR jobs would require several passes of the log to restore the DB2 system to the common recovery time.
- e. Runxxxx#JC3 from the DR PDS.
This job will start all spaces in R/W mode.
- f. Run xxxx#JC4 from the DR PDS.
This job will find DB2 objects in recover or rebuild pending and build JCL to restore those objects from image copies. This could be needed if a LOG NO event occurred for an object in the time span between the SLB and the common recovery time. If any objects need to be recovered, the recovery JCL will be generated into xxxx#JC5 in the DR PDS.
- g. If xxxx#JC5 was generated by the previous step, run xxxx#JC5 from the DR PDS.
Run this job to recover all recover pending and rebuild pending objects.

Coordinated IMS and DB2 Disaster Recovery with Improved RPO and RTO

For an IMS and DB2 disaster recovery with IMS Recovery Expert and DB2 Recovery Expert, the Recovery Point Objective (RPO) is based on the frequency of taking and shipping the system-level backup and recovery assets to the remote site and the frequency of running the Intelligent Disaster Recovery Manager preparation job at the local site. The use of replicated Virtual Tape can reduce the time needed to get the SLB, archive logs, and DR PDS to the remote site.

The Recovery Time Objective (RTO) is lower than traditional disaster recovery solutions that need to recover table space and database data sets from image copies taken at various times. With IMS Recovery Expert and DB2 Recovery Expert, the full IMS and DB2 system, including all databases and tablespaces, is restored quickly and to the same point-in-time using volume-level restores. The roll



forward recovery for all databases and tablespaces begins at the same spot in the archive logs and can be processed with a single pass of the logs.

IMS Recovery Expert and DB2 Recovery Expert offer a simplified and automated tape-based disaster recovery solution, providing recovery across an IMS and DB2 system to a common consistent point-in-time.

This Red Note includes only an overview of the Intelligent Disaster Recovery Manager features to provide a coordinated IMS and DB2 disaster recovery. To find out more information about other IMS Recovery Expert and DB2 Recovery Expert features, see the following resources:

DB2 for z/OS and IMS Tools Library website:

www.ibm.com/software/data/db2imstools/library.html

IBM IMS Recovery Expert for z/OS Users Guide (SC19-2473-00)

IBM DB2 Recovery Expert for z/OS users Guide (SC19-2548-01)

IBM Redbook publications:

www.redbooks.ibm.com

Optimizing Restore and Recovery Solutions with DB2 Recovery Expert V2.1

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