Adabas Utility Functions for the Adabas Delta Save Facility

The Adabas utilities manage the resources of an Adabas database. General Adabas utility operation and use are described in the basic Adabas documentation library. The information in this documentation applies only to the new and/or expanded utility functions required for an Adabas database running with the Delta Save Facility.

The following utility functions are described in this documentation for the Adabas Delta Save Facility:

Utility	Function	Action
ADAFRM (formatting)	DSIMFRM	Format the Delta Save Images (DSIM) data set.
	DSIMRESET	Reset an incorrect DSIM data set for reuse.
ADAPRI (printing)	DSIMPRI	Print DSIM data set blocks.
ADAREP (reporting)	ADAREP	Functions expanded for Delta Save operation where applicable.
ADARES (recovery)	COPY	Copy a sequential log data set.
	PLCOPY	Copy dual or multiple PLOG data sets to a single sequential data set.
ADASAV (save/restore)	MERGE	Combine delta save outputs with each other, and/or with the last full database save output.
	RESTORE DELTA	Restore files/database from separate full and delta save outputs.
	SAVE	Save the complete database to a full save data set.
	SAVE DELTA	Save the changed portions of the database to a delta save data set.
ADAULD (unloading)	UNLOAD with SAVETAPE	Unload from a full save tape, 1-8 delta save tapes, and optionally the DSIM data set.

The ADASAV RESTORE function is unchanged for conventional full save tapes, and can also be used to restore consolidated full save tapes that were created with ADASAV MERGE.

This chapter covers the following topics:

- Utility Considerations for Delta Save Operation

- VSE/ESA Job Control for Delta Save

Utility Considerations for Delta Save Operation

In addition to the changes made to the ADASAV and ADARES utilities to allow delta save/merge/restore operations, changes have also been made to the ADAFRM, ADAPRI and ADAREP utilities.

The following points should be considered when running Adabas utilities with DSF:

- Changes made to database files by utilities (ADAINV, ADALOD, ADAORD and ADASAV RESTORE) are marked in the file control blocks (FCBs). The next Delta Save operation saves the changed parts (that is, the Data Storage, address converter and/or index) of the affected files;

- Delta Save operations are *not recommended* following ADAFRM utility runs that reset parts of the Associator or of Data Storage, since such changes are *not* logged. This means that those blocks are not *necessarily* saved by a later Delta Save operation. Therefore, any save following these operations should be a full database save.

Identifying New AC Extents Allocated During an Online Save

Every time the Adabas nucleus allocates a new address converter (AC) extent, it clears (fills with binary zeros) all blocks of that extent.

If a new AC extent is allocated during an online save, the Adabas nucleus writes a *special type of protection record* to the PLOG identifying the new extent and the blocks the nucleus has cleared. Like any online dump block, this protection record is written to the PLOG only, not to Work part 1.

The special protection record type is short and contains in its header only the file number and the first and last RABN of the newly allocated and cleared AC extent. The protection record has no data part.

ADARES PLCOPY (or COPY) recognizes the special protection record type when extracting online dump blocks from the PLOG and writing them to the DSIM data set. For each such protection record encountered, it creates special DSIM directory entries that contain the file number and one RABN of the new AC extent. ADARES creates one directory entry for each new AC block. There are no associated DSIM detail records containing the block images, since the blocks are known to be empty (binary zeros).

When the DSIM data set is processed for merging or unloading, the sort of the DSIM directory correctly positions the entries for new AC blocks within the sequence of all blocks and removes new AC entries made obsolete by subsequent block images written later in time.

New AC entries resulting from the merge process are substituted by empty AC blocks of the proper length. For an unload of the DSIM data set, the correct block size cannot be determined because no GCB is present, so any block deriving from a new AC entry is constructed with zero block length. The correct block length is determined in the next ADASAV MERGE or ADASAV RESTORE DELTA operation.

Note:
The ADASAV RESTONL and RESTPLOG functions ignore the special AC extent record type on the protection log and continue comparing FCBs to determine any newly allocated and formatted address converter extents.

VSE/ESA Job Control for Delta Save

The VSE/ESA sample jobs used by Adabas utilities operations assume that the procedures for defining Adabas libraries (ADAVvLIB) and Adabas files (ADAVvFIL) have been cataloged into an accessible procedure library.

For information about cataloging these procedures, see the section *Cataloging Procedures for Defining the Delta Save Libraries and Files*.