

Restructuring a CA IDMS™ Database

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Abstract

- This session presents considerations for restructuring a CA IDMS database. It focuses on the RESTRUCTURE and RESTRUCTURE CONNECT utility statements, and the schema compare utility, IDMSRSTC. Topics include when and how to use the utilities, and a discussion of a sample restructure.



Agenda

- Changes requiring a restructure
- RESTRUCTURE/RESTRUCTURE CONNECT utility
- IDMSRSTT macros and the IDMSRSTC utility
- Steps to run a restructure
- Sample restructure
- Questions and Answers

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Changes Requiring a Restructure

Changes to the database that require the use of the RESTRUCTURE/RESTRUCTURE CONNECT utilities include:

- Insert new data items anywhere in a record
- Delete existing data items
- Change the length and position of data items
- Change the format of a record from fixed to variable length or from variable to fixed length
- Add new sets
- Delete existing sets
- Add or delete prior or owner pointers for existing sets
- Add or remove certain database procedures
- Change the control length of compressed records

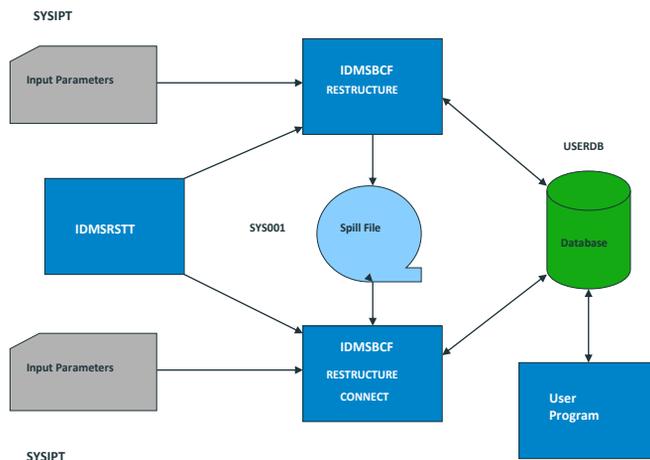
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RESTRUCTURE/RESTRUCTURE CONNECT Utilities



Using the RESTRUCTURE Utilities

- The RESTRUCTURE utilities are only used against network databases
- The RESTRUCTURE utilities only run in a batch local mode
- Changes to the database are made in place
- Database keys remain the same so relocated records (SR2/SR3) may be created
- Logically deleted records are not allowed in a database that is to be restructured
- The user must create a base restructuring module (IDMSRSTT) that is used as the template for making the physical changes
- RESTRUCTURE cannot be used against native VSAM files

RESTRUCTURE

- Drives the actual physical changes to the database using the IDMSRSTT module as a template
- Writes records to the spill file (SYS001) if PRIOR pointers are being added to an existing set
- Uses a subschema with the original view of the database

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RESTRUCTURE CONNECT

- The RESTRUCTURE CONNECT utilities need only be run if the RESTRUCTURE utility added PRIOR or OWNER pointers to an existing set
- Reads records from the spill file (SYS001) although the file will be empty if only the addition of OWNER pointers is involved
- Uses a subschema describing the new structure of the database

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RESTRUCTURE CONNECT (cont.)

- A user written program is required to perform the following updates to the restructured database:
 - Populate new data fields or the new portions of expanded fields if more than a single default value is required
 - Connect member records to newly added sets
- Since this program would use standard DML commands it can be run locally or through the CV
- Uses a subschema describing the new database structure

IDMSRSTT Statements

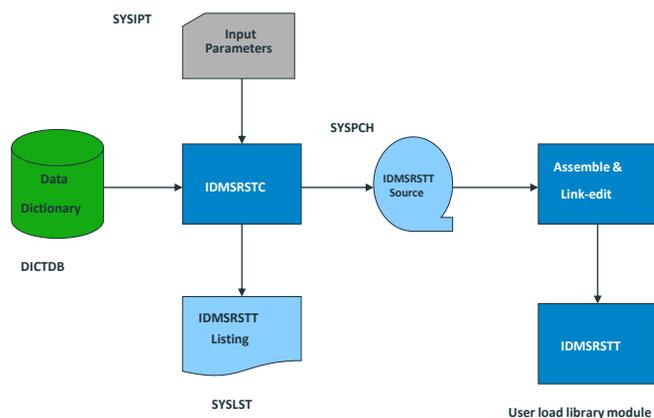
IDMSRSTT statements are actually Assembler macros that provide the template for the way in which the RESTRUCTURE utility will alter the database.

- IDMSRSTT BUFSIZE
 - Specifies the size of the largest restructured record
 - First macro statement in IDMSRSTT
- IDMSRSTT RECNAME
 - Identifies a record type to be restructured
 - One for each record being changed
 - Provides format and length information
 - Identifies new DB procedures to be executed

IDMSRSTT Statements (cont.)

- IDMSRSTT SETPTR
 - Specifies pointer positions for record
- IDMSRSTT FIELD
 - Identifies data fields in a restructured record
- IDMSRSTT END
 - Identifies the logical end of the macro to the Restructure Segment statement
- END
 - Last macro statement in the deck
 - Identifies the end of the macro to the assembler

IDMSRSTC



Using IDMSRSTC

- IDMSRSTC runs in either batch-CV or batch local environment
- Input to the utility consists of a schema defining the old view of the database and a second schema defining the new view
- The IDMSRSTT macros generated should be reviewed for accuracy
- Multiple schema pairs may be processed in a single run, but the IDMSRSTT macros for each schema pair must be separated prior to assembly

Steps to Run IDMSRSTC

- Run Create a schema that describes the new description of the database
- Run the IDMSRSTC utility
- Review the IDMSRSTT macros for accuracy
- Run your standard installation assembler using the file created by IDMSRSTC as input
- Link the resulting object module to a load library

IDMSRSTC/IDMSRSTT Example

```
SIGNON USAGE MODE IS RETRIEVAL.  
OLD SCHEMA NAME IS LRDKSCHM  
NEW SCHEMA NAME IS LRDKSCH2.  
*  
IDMSRSTT BUFSIZE=(500,500)   OLD BB  
*                               NEW BB  
IDMSRSTT RECNAME=AA  
IDMSRSTT SETPTR=(1,1)   COPY OWNER NEXT A-B  
IDMSRSTT SETPTR=(*,2,A-B)   ADD OWNER PRIOR A-B  
IDMSRSTT FIELD=ALL  
IDMSRSTT RECNAME=BB,MINLEN=(16,40,452),DCT=BUILTIN  
IDMSRSTT SETPTR=(1,1)   COPY MEMBER NEXT A-B  
IDMSRSTT SETPTR=(,2,A-B)   ADD MEMBER PRIOR A-B  
IDMSRSTT SETPTR=(,3,A-B)   ADD MEMBER OWNER A-B  
IDMSRSTT SETPTR=(2,4)   COPY MEMBER INDEX IX-BB  
IDMSRSTT FIELD=(1,1,16)  
IDMSRSTT FIELD=(17,17,436)  
IDMSRSTT END  
END
```

Steps to Run a RESTRUCTURE

1. Create a new database definition
 - Create a schema describing the new database structure
 - Create/regenerate affected subschemas using the new schema
2. Create the IDMSRSTT by running IDMSRSTC
3. Vary the areas to be modified offline from any active CV's
4. Backup the affected areas
5. Run the RESTRUCTURE utility

Steps to Run a RESTRUCTURE (cont.)

6. If PRIOR or OWNER pointers were added to any existing set run the RESTRUCTURE CONNECT utility
7. If new sets were added or record occurrence specific values for new fields are required run a user-written program using the new database definition to perform the necessary updates
8. Validate the database
9. Backup the affected areas
10. Migrate new subschemas and any modified programs to the appropriate CV environments
11. Vary the areas back to an update mode

Sample Restructure

Original Schema

```
ADD
RECORD NAME IS RJWRREO1
RECORD ID IS 1001
LOCATION MODE IS DIRECT
WITHIN AREA AREA-1.
02 RJWRREO1-FIELD1 PICX(100).
02 RJWRREO1-FIELD2 PICX(100).
02 RJWRREO1-FIELD3 PICX(100).
02 RJWRREO1-FIELD4 PICX(100).
02 RJWRREO1-FIELD5 PICX(100).
```

Modified schema

```
ADD
RECORD NAME IS RJWRREO1
RECORD ID IS 1001
LOCATION MODE IS DIRECT
WITHIN AREA AREA-1.
02 RJWRREO1-FIELD1 PICX(100).
02 RJWRREO1-FIELD2 PICX(100).
02 RJWRREO1-FIELD3 PICX(100).
02 RJWRREO1-FIELD4 PICX(100).
02 RJWRREO1-FIELD5 PICX(100).
02 RJWRREO1-FIELD6 PICX(100).
02 RJWRREO1-FIELD7 PICX(100).
```

Sample Restructure (cont.)

Original Schema

```
ADD
SET NAME IS REO1-REO2
ORDER IS NEXT
MODE IS CHAIN LINKED TO PRIOR
OWNER IS RJWRREO1
NEXT DBKEY POSITION IS 1
PRIOR DBKEY POSITION IS 2
MEMBER IS RJWRREO2
NEXT DBKEY POSITION IS 1
PRIOR DBKEY POSITION IS 2
MANDATORY AUTOMATIC.
```

Modified schema

```
ADD
SET NAME IS REO1-REO2
ORDER IS NEXT
MODE IS CHAIN LINKED TO PRIOR
OWNER IS RJWRREO1
NEXT DBKEY POSITION IS 1
PRIOR DBKEY POSITION IS 2
MEMBER IS RJWRREO2
NEXT DBKEY POSITION IS 1
PRIOR DBKEY POSITION IS 2
LINKED TO OWNER
OWNER DBKEY POSITION IS 3
MANDATORY AUTOMATIC.
```

Sample Restructure (cont.)

IDMSRSTC generated IDMSRSTT statements

```
IDMSRSTT BUFSIZE=(600,800) OLD RJWRREO2
* NEW RJWRREO1
IDMSRSTT RECNAME=RJWRREO1
IDMSRSTT SETPTR=ALL
IDMSRSTT FIELD=(1,1,100) COPY RJWRREO1-FIELD1
IDMSRSTT FIELD=(101,101,100) COPY RJWRREO1-FIELD2
IDMSRSTT FIELD=(201,201,100) COPY RJWRREO1-FIELD3
IDMSRSTT FIELD=(301,301,100) COPY RJWRREO1-FIELD4
IDMSRSTT FIELD=(401,401,100) COPY RJWRREO1-FIELD5
IDMSRSTT FIELD=(100CL1'',501,100,NEW)
* INIT RJWRREO1-FIELD6
IDMSRSTT FIELD=(100CL1'',601,100,NEW)
* INIT RJWRREO1-FIELD7
IDMSRSTT RECNAME=RJWRREO2
IDMSRSTT SETPTR=(1,1) COPY MEMBER NEXT REO1-REO2
IDMSRSTT SETPTR=(2,2) COPY MEMBER PRIOR REO1-REO2
IDMSRSTT SETPTR=(,3) ADD MEMBER OWNER REO1-REO2
IDMSRSTT FIELD=ALL
IDMSRSTT END
END
```

Sample Restructure (cont.)

- The RESTRUCTURE utility would be run with the following input parameters:

RESTRUCTURE SEGMENT REOGMEDM USING RJWSSRE1

RSTTMOD RJWRSTT ;

Where: RJWSSRE1 is the subschema that describes the original structure of the database
RJWRSTT is the name of the load module created from the generated IDMSRSTT statements

- The RESTRUCTURE CONNECT utility would be run with the following input parameter to connect the new OWNER pointers:

RESTRUCTURE CONNECT SEGMENT REOGMEDM USING RJWSSRE2

RSTTMOD RJWRSTT;

Where: RJWSSRE2 is the subschema that describes the new structure of the database
RJWRSTT is the name of the load module created from the generated IDMSRSTT statements

Summary

- Changes requiring a restructure
- RESTRUCTURE/RESTRUCTURE CONNECT utility
- IDMSRSTT macros and the IDMSRSTC utility
- Steps to run a restructure
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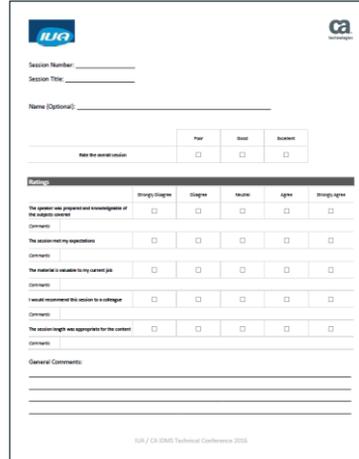
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