DATA SYNCHRONIZATION FACILITY

The SQL/Data Synchronization Facility (**SQL/DSF**) assists DB2/VM database administrators in managing **distributed** database environments. In such environments, it must be ensured that the distributed tables remain in a consistent state.

The following SQL/DSF facilities help database administrators in achieving this goal:

Synchronization

Propagates changes performed on DB2/VM tables to other databases.

Transfer

Transfers tables between different databases.

Compare

Compares tables in different databases.

Conditional transfer

Transfers a table to the target database, when a table compare results in mismatch.

All SQL/DSF functions are performed from the VM/ESA DB2/VM environment.

They operate on DB2/VM databases or database platforms that can connect to DB2/VM, using the DRDA protocol. For the synchronization function however, the source database **must** be DB2/VM.

The table transfer and compare functions perform using **CMS workunits**: no disk or tape storage is required during their operation.

SQL/DSF functions can be invoked :

- From the CMS prompt or a REXX program.
- Using the **RULES** file of the SQL/DSF **Synchronization Scheduler**.
- By submission of a **command file** to the Scheduler.

Table Synchronization

Synchronization propagates table changes from the DB2/VM source database to another DB2/VM or any other database platform that can connect to DB2/VM. Synchronization is a cost-effective alternative for a complete table copy, as it applies only the INSERT, DELETE and UPDATE statements executed in the source database.

Data Capturing

Synchronization implies that the source table changes have been captured in the source database. The capturing function is performed by the **SQL/Auditing Facility,** a program product available from Software Product Research.

All SQL statements, both dynamic and compiled, are captured, regardless of their origin.

Synchronization Method

The log of the SQL/Auditing Facility contains the full text of all SQL statements captured in the DB2/VM server. Synchronization consists in executing these statements against the target database.

Contrarily to other synchronization software, which executes in dynamic mode, SQL/DSF synchronizes static (compiled) SQL package statements to the target table in the same **static SQL execution mode**. To achieve this, SQL/DSF automatically creates and maintains “shadow” packages in the target database.

Synchronizing to a CMS file

If the target database cannot connect to DB2/VM using DRDA, SQL/DSF can be requested to create a CMS file with all SQL statements needed to synchronize the target table. This file may then be submitted to the command processor of the target database.

Synchronization Performance

Since SQL/DSF uses the **captured statement** for synchronization (and not the DB2/VM log), an SQL statement that alters multiple rows will be synchronized in a single transaction.

The **static synchronization** method of SQL/DSF is considerably faster than dynamic synchronization, commonly used by synchronization software. As a result, throughput of synchronization will be comparable to that of the SQL statements in the originating applications.

Using SQL/DSF for data restore

Since the audit log and archives contain, in executable format, all SQL statements that altered the table, the archives can be considered as incremental backup files. Consequently, the synchronization function can be used to incrementally restore a DB2 table from an audit log or archive.

Table Transfer

The transfer function copies all rows of a designated table to the target table in another database. At the user's choice, transfer will replace or append to the target. It is also possible to transfer a **subset** of the source table to the target.

Table Compare

The function compares all rows of a named table with the table in the designated target database and prints the contents of the mismatching rows.

Conditional Table Transfer

The conditional transfer function is a combination of the compare and the transfer functions. A conditional transfer compares both tables and initiates a transfer when the compare results in a mismatch.

The SQL/DSF Scheduler

SQL/DSF provides the **SQLDSFS** Scheduler program to assist an installation in setting up a **DataSync Server** environment. Using the Scheduler, most synchronization tasks can be automated.

The Scheduler processes:

- table synchronizations and transfers **automatically** and **chronologically**, as recorded in its **RULES** file

- SQL/DSF **command files** forwarded by means of the SQLDSF SUBMIT command

SQL/DSF and IBM DataProp compared

- SQL/DSF is a specialized propagator for DB2/VM. It cannot synchronize changes performed on tables other than DB2/VM. DataProp has a wider scope.
- SQL/DSF can synchronize directly to a DB2/VM target. This is not possible using DataProp apply.
- SQL/DSF can indirectly synchronize to database servers that cannot connect to DB2/VM, by providing a synchronization file.
- SQL/DSF uses a **statement-based** synchronization method, while DataProp operates at the data level, using the DB2/VM log. As a result, SQL/DSF will more efficiently synchronize SQL statements that alter multiple rows.
- When large volumes of data must be synchronized, the **static synchronization** method implemented by SQL/DSF will be considerably faster than DataProp.
- SQL/DSF can be used for **Data Restore**.
- Since SQL/DSF executes entirely in the DB2/VM environment, its setup and operations are simpler than DataProp.

Prerequisites

- VM/ESA Version 1 Release 1 or later
- DB2/VM Version 3.3 or later
- SQL/Auditing Facility, a program product available from Software Product Research.
