

# SQL/COMMAND ANALYSIS

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SQL/Command Analysis (“**SQL/CA**”) is a software tool that analyzes the **performance** of DB2/VSE applications. The product assists developers in producing high-quality DB2 applications. With SQL/CA, poorly written SQL can be detected and corrected at the **development** stage. Using SQL/CA, developers will deliver applications that perform efficiently in the operational database environment.

SQL/CA operates on the **source text** of the program. Therefore it can signal SQL performance deviations, not detected by more traditional tuning procedures.

SQL/CA presents the results of analysis in an interactive **analysis report**. The report is easy to read and does not require a highly technical background to be understood. The report is stored in a VSAM file: it is displayed at the end of an analysis.

SQL/CA is capable of analyzing:

- Assembler, COBOL, Fortran and PL/1 program sources
- ISQL routines and QMF procedures
- Files containing SQL statements in SQL Database Services format
- DB2 packages in the currently connected database

## SQL EXPLAIN

EXPLAIN is a performance tuning command provided by DB2/VSE. It shows the method chosen by DB2 to access the data. As the first step of an analysis, SQL/CA performs **EXPLAIN** for all SQL statements in the application.

SQL/CA enhances the EXPLAIN results:

- by converting the encoded EXPLAIN data to a more readable format
- by carrying out additional computations and data substitutions
- by integrating information from the DB2 catalogs into the analysis report
- by flagging statements, when their explain results indicate a possible performance exposure
- if our SQL/Monitoring program product has been installed, the latest **run-time** statistics for the application are included in the analysis report.

## Predicate analysis

SQL/CA is more than an automated EXPLAIN tool: its **predicate analysis** function examines the application’s SQL for adherence to the performance rules described in the IBM manual “**Performance Tuning Handbook**”. Each SQL statement in the application is checked against each of the documented performance rules. When a statement violates one of the rules, it is flagged with an appropriate message.

Some examples of performance rules enforced:

- the statement should not update a primary indexing column
- the predicate should not use expressions on indexing columns
- the predicate should observe the datatype and datalength compatibility rules
- the statement operator used in the predicate should be an *index keymatching candidate*
- the statement predicate should be eligible for use as a direct database search argument
- leading columns of a multicolumn index should not be omitted

A rule violation results in a warning message. These messages can be searched online in the SQL/CA **Glossary**, which describes the detected performance exposure in full detail and suggests corrective action. The Glossary also explains the rules governing the evaluation of the statement predicate.

## Object lists

At the end of the analysis report, SQL/CA shows the catalog information for all tables and indexes used by the program.

## Analysis options

### Command Analysis in server mode

A request for analysis is submitted online from a CICS transaction. Analysis itself is performed in a batch partition under the DB2 userid of the SQL/CA server.

Since the SQL/CA server has the DBA privilege, developers can analyze their applications against operational databases, which usually they cannot access.

### Archiving the analysis results

The analysis report is stored in the SQL/CA Report Library, with a logical sublibrary for each SQL/CA user. The sublibrary is managed online, using a CICS transaction. The same transaction is used to read the analysis reports. Multiple analysis reports for the same application can exist in the sublibrary.

### Catalog modelling

It is desirable that the characteristics of development databases match those of the production databases as closely as possible. This ensures that access paths chosen by DB2 in the development environment will be similar to those in the production system.

DB2/VSE allows a DBA to perform database modelling, by modifying the catalog columns that intervene in access path determination. Manually updating the catalogs however is a time-consuming process and requires knowledge of internal data formats.

SQL/CA offers a utility program to copy catalog information from one database to another.

### Connecting a DB2/VSE database

Connection to any database may be requested during analysis.

## SQL/CA Software prerequisites

VSE/ESA Version 2 Release 2.0 and later  
DB2/VSE Version 3 Release 5 and later