IBM Systems - iSeries

DB2 Query Manager and SQL Development Kit for iSeries Commands

Version 5 Release 4
Note
Before using this information and the product it supports, be sure to read the information in "Notices,” on page 181.
## Contents

<table>
<thead>
<tr>
<th>Create SQL COBOL Program (CRTSQLCBL)</th>
<th>Create SQL ILE RPG Object (CRTSQLRPGL)</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create SQL ILE COBOL Object (CRTSQLCBLI)</td>
<td>Convert SQL C++ Source (CVTSQLCPP)</td>
<td>19</td>
</tr>
<tr>
<td>Create SQL ILE C object (CRTSQLCI)</td>
<td>Start DB2 UDB Query Manager (STRQM)</td>
<td>39</td>
</tr>
<tr>
<td>Create SQL ILE C++ Object (CRTSQLCPPI)</td>
<td>Start SQL Interactive Session (STRSQL)</td>
<td>59</td>
</tr>
<tr>
<td>Create SQL FORTRAN Program (CRTSQLFTN)</td>
<td>Appendix. Notices</td>
<td>79</td>
</tr>
<tr>
<td>Create SQL PL/I Program (CRTSQLPLI)</td>
<td></td>
<td>97</td>
</tr>
<tr>
<td>Create SQL RPG Program (CRTSQLRPG)</td>
<td></td>
<td>115</td>
</tr>
</tbody>
</table>
Create SQL COBOL Program (CRTSQLCBL)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Create SQL COBOL Program (CRTSQLCBL) command calls the Structured Query Language (SQL) precompiler which precompiles COBOL source containing SQL statements, produces a temporary source member, and then optionally calls the COBOL for iSeries compiler to compile the program.

If the Relational database (RDB) parameter is specified and a program is created, an SQL package will be created at the specified relational database.

### Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGM</td>
<td>Program</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *PGM</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text ‘description’</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, ' '</td>
<td>Optional</td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSQLCR</td>
<td>Close SQL cursor</td>
<td>*ENDPGM, *ENDSQL, *ENDJOB</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLC</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>&quot;&quot;, &quot;,&quot;, &quot;,&quot;, &quot;,&quot;, &quot;,&quot;, &quot;,&quot;, '-'</td>
<td>Optional</td>
</tr>
</tbody>
</table>

© Copyright IBM Corp. 1998, 2006
<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, *';', *';', *';', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Replace</td>
<td>*YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>RDBCNNMTH</td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td>DFTRDBCOL</td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNDFTCOL</td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPKG</td>
<td>Package</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Package</td>
<td>Name, *PGM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *PGMLIB</td>
<td></td>
</tr>
<tr>
<td>SQLPATH</td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other values (up to 268 repetitions): Name</td>
<td></td>
</tr>
<tr>
<td>SQLCURRULE</td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td>SAAFLAG</td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td>FLAGSTD</td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td>PRTFILE</td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Print file</td>
<td>Name, QSYSPT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>USRPRF</td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNUSRPRF</td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other values: Qualified object name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Sort sequence</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>LANGID</td>
<td>Language id</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>TOSRCFILE</td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: To source file</td>
<td>Name, QSQLTEMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, QTEMP, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>DECRERESULT</td>
<td>Decimal result options</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Element 1: Maximum precision</td>
<td>31, 63</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 2: Maximum scale</td>
<td>0-63, 31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 3: Minimum divide scale</td>
<td>0-9, 0</td>
<td></td>
</tr>
<tr>
<td>COMPILEOPT</td>
<td>Compiler options</td>
<td>Character value, *NONE</td>
<td>Optional</td>
</tr>
</tbody>
</table>

**Program (PGM)**

Specifies the program to be created.

This is a required parameter.

**Qualifier 1: Program**

- **name** Specify the name of the program to be created.

**Qualifier 2: Library**
The current library for the job is used to locate the compiled program. If no current library entry exists in the library list, QGPL is used.

*Source file (SRFCFILE)*

Specifies the source file that contains the COBOL source statements and SQL statements.

**Qualifier 1: Source file**

QLBLSRC

Source file QLBLSRC contains the COBOL source.

*name* Specify the name of the source file that contains the COBOL source. This source file should have a record length of 92. The source file can be a database file, device file, or an inline data file.

**Qualifier 2: Library**

*LIBL* All libraries in the job’s library list are searched until the first match is found.

*CURLIB* The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

*name* Specify the name of the library to be searched.

*Source member (SRCMBR)*

Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the Source file (SRFCFILE) parameter is a database file.

*PGM* The source file member that has the same name as the program name specified for the Program (PGM) parameter contains the input source.

*name* Specify the name of the source file member that contains the input source.

*Commitment control (COMMIT)*

Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR*

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS*

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are
locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or *RS
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC
Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

**Relational database (RDB)**

Specifies the name of the relational database where the SQL package is to be created.

*LOCAL
The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE
An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name
Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

**Text ’description’ (TEXT)**

Specifies text that briefly describes the program and its function.

*SRCMBRTXT
The text is taken from the source file member being used to create the program. If the source file is an inline file or a device file, the text is blank.

*BLANK
No text is specified.

’description’
Specify no more than 50 characters, enclosed in apostrophes.
**RDB user (USER)**

Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

*CURRENT
   The user name associated with the current job is used.

name Specify the user name to be used for the application server job.

**RDB user password (PASSWORD)**

Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.

*NONE
   No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this value is specified.

   *Note: Specifying a password of a blank is the same as specifying *NONE.

password
   Specify the password of the user name specified for the USER parameter.

**Precompiler options (OPTION)**

Specifies whether the following options are used when the COBOL source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

**Source listing options:**

*NOSRC or *NOSOURCE
   The precompiler does not produce a source printout unless errors are detected during precompile or create package.

*SRC or *SOURCE
   The precompiler produces a source printout.

**Cross reference options:**

*NORXREF
   The precompiler does not produce a cross-reference of names.

*XREF
   The precompiler produces a cross-reference between items declared in your program and the numbers of the statements in your program that refer to these items.

**Host language compiler call options:**

*GEN
   The precompiler calls the COBOL compiler. If a relational database name is specified for the Relational database (RDB) parameter, and the compile is successful, an SQL package is also created.

*NOSRC
   The precompiler does not call the COBOL compiler. Neither a program nor an SQL package is created.
SQL string delimiter options:

*QUOTESQL
The character used as the string delimiter in the SQL statements is the quote (”).

*APOSTSQL
The character used as the string delimiter in the SQL statements is the apostrophe (’).

COBOL string delimiter options:

*QUOTE
The character used for nonnumeric literals and Boolean literals in the COBOL statements is the quote (”).

*APOST
The character used for nonnumeric literals and Boolean literals in the COBOL statements is the apostrophe (’).

Decimal point options:

*JOB
The representation for the decimal point specified for the job at precompile time is used.

Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2,23.4,1) where the decimal point is the period.

*SYSVAL
The value used as the decimal point in numeric constants is from the QDECFMT system value. This value is also used as the decimal point character when casting a numeric value to character.

Note: If QDECFMT specifies that the value used as the decimal point is a comma; any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

*PERIOD
The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

*COMMA
The value used as the decimal point in numeric constants is a comma. Any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

Naming convention options:

*SYS
Specifies that the system naming convention is used (library-name/file-name).

*SQL
Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the **Relational database (RDB)** parameter, and the database is on a system that is not an iSeries system, *SQL must be specified as the naming convention.

Second-level message text options:

*NOSCLVL
Second-level text descriptions are not added to the listing.

*SCCLVL
Second-level text with replacement data is added for all messages on the listing.
Debug listing view options:

*NOLSTDBG
Error and debug information is not generated.

*LSTDBG
The SQL precompiler generates a listing view and error and debug information required for this view.

*Note: You can only use *LSTDBG if you are using the CODE product to compile your program.

Target release (TGTRLS)
Specifies the release of the operating system on which you intend to use the object being created.

When specifying the target-release value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT
The object is to be used on the release of the operating system currently running on your system. The object can also be used on a system with any subsequent release of the operating system installed.

*PRV The object is to be used on the previous release with modification level 0 of the operating system. The object can also be used on a system with any subsequent release of the operating system installed.

target-release
Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

INCLUDE file (INCFILE)
Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

Single values

*SRCFILE
The qualified source file you specify for the Source file (SRCTYPE) parameter contains the source file members specified on any SQL INCLUDE statements.

Qualifier 1: INCLUDE file

name
Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the Source file (SRCTYPE) parameter.
Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.

*CURLIB The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the source file is located.

Allow copy of data (ALWCPYDTA)

Specifies whether a copy of the data can be used in a SELECT statement.

*OPTIMIZE The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

*YES A copy of the data is used only when necessary.

*NO A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQLCSP)

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks released. SQL cursors are explicitly closed by issuing the CLOSE, COMMIT (without HOLD), ROLLBACK (without HOLD), or CONNECT (Type 1) SQL statements.

*ENDPGM The SQL cursors are closed and SQL prepared statements are discarded when the program ends. LOCK TABLE locks are released when the first SQL program on the call stack ends.

*ENDSQL The SQL cursors remain open between calls and rows can be fetched without running another SQL OPEN statement. One of the programs higher on the call stack must have run at least one SQL statement. The SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the first SQL program on the call stack ends. If you specify *ENDSQL for a program that is the first SQL program called (the first SQL program on the call stack), the program is treated as if *ENDPGM was specified.

*ENDJOB SQL cursors remain open between calls and can be fetched without running another SQL OPEN statement. The programs higher on the call stack do not need to have run SQL statements. SQL cursors are left open, SQL prepared statements are preserved, and LOCK TABLE locks are held when the first SQL program on the call stack ends. SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the job ends.
Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.

*ALLREAD

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying *ALLREAD:

- Allows record blocking for all read-only cursors.
- Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  - The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
  - Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

*NONE

Rows are not blocked for retrieval of data for cursors.

Specifying *NONE:

- Guarantees that the data retrieved is current.
- May reduce the amount of time required to retrieve the first row of data for a query.
- Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
- Can degrade the overall performance of a query that retrieves a large number of rows.

*READ

Records are blocked for read-only retrieval of data for cursors when:

- *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
- The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

Delay PREPARE (DLYPRP)

Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

*NO

Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

*YES

Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled
programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

**Note:** If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.

### Severity level (GENLVL)

Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.

If the **Relational database (RDB)** parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.

**10** Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated.

**0-40** Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called.

### Date format (DATFMT)

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

**Note:** An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

**JOB** The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

**USA** The United States date format **mm/dd/yyyy** is used.

**ISO** The International Organization for Standardization (ISO) date format **yyyy-mm-dd** is used.

**EUR** The European date format **dd.mm.yyyy** is used.

**JIS** The Japanese Industrial Standard date format **yyyy-mm-dd** is used.

**MDY** The date format **mm/dd/yy** is used.

**DMY** The date format **dd/mm/yy** is used.

**YMD** The date format **yy/mm/dd** is used.

**JUL** The Julian date format **yy/ddd** is used.
Date separator character (DATSEP)

Specifies the separator to be used when accessing date result columns.

**Note:** This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the **Date format (DATFMT)** parameter.

*JOB  The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

'/'  A slash is used as the date separator.

'.'  A period is used as the date separator.

'-'  A dash is used as the date separator.

','  A comma is used as the date separator.

' ' or *BLANK  A blank is used as the date separator.

Time format (TIMFMT)

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS  The **hh:mm:ss** format is used.

*USA  The United States time format **hh:mmxx** is used, where xx is AM or PM.

*ISO  The International Organization for Standardization (ISO) time format **hh.mm.ss** is used.

*EUR  The European time format **hh.mm.ss** is used.

*JIS  The Japanese Industrial Standard time format **hh:mm:ss** is used.

Time separator character (TIMSEP)

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the **Time format (TIMFMT)** parameter.

*JOB  The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

':'  A colon is used as the time separator.
A period is used as the time separator.
A comma is used as the time separator.
A blank is used as the time separator.

Replace (REPLACE)
Specifies whether a SQL program or SQL package is created when there is an existing SQL program or SQL package of the same name in the same library. The value is passed to the CRTxxxPGM command (where xxx is the language of the program being created) and the Create SQL Package (CRTSQLPKG) command if the RDB parameter is specified.

*YES An SQL program or SQL package is created and any existing SQL program or SQL package of the same name in the specified library is moved to QRPOBJ. The authorities for the existing SQL package are kept for the new SQL package.

*NO An SQL program or package is not created if an SQL program or package of the same name already exists in the specified library.

RDB connect method (RDBCNNMTH)
Specifies the semantics used for CONNECT statements.

*DUW CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

Default collection (DFTRDBCOL)
Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE The naming convention specified for the Precompiler options (OPTION) parameter is used.

name Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

Dynamic default collection (DYNDFTCOL)
Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.
**NO**  Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.

**YES**  The schema name specified for the DFTRDBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.

---

**Package (SQLPKG)**

Specifies the name and library of the SQL package to be created on the remote relational database specified for the Relational database (RDB) parameter of this command.

**Qualifier 1: Package**

**PGM**  The name of the SQL package is the same as the program name.

name  Specify the name of the SQL package. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

**Qualifier 2: Library**

**PGMLIB**  The SQL package is placed in the schema that has the same name as the library containing the program.

name  Specify the name of the schema where the SQL package is to be placed. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

---

**SQL path (SQLPATH)**

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

**NAMING**  The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For *SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

**LIBL**  The path used is the library list at runtime.

name  Specify one or more schema names. A maximum of 268 schema names may be specified.

---

**SQL rules (SQLCURRULE)**

Specifies the semantics used for SQL statements.
*DB2  The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

Hexadecimal constants are treated as character data.

*STD  The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:

Hexadecimal constants are treated as binary data.

IBM SQL flagging (SAAFLAG)

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG  No checks are made to see whether SQL statements conform to IBM SQL syntax.

*FLAG  Checks are made to see whether SQL statements conform to IBM SQL syntax.

ANS flagging (FLAGSTD)

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE  No checks are made to see whether SQL statements conform to ANSI standards.

*ANS  Checks are made to see whether SQL statements conform to standards.

Print file (PRTFILE)

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

QSYSPR

The precompiler output file is directed to the IBM-supplied printer file, QSYSPR. The file QSYSPR has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

name  Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIBL  All libraries in the job’s library list are searched until the first match is found.

*CURLIB  The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name  Specify the name of the library where the printer file is located.
User profile (USRPRF)

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

**NAMING**
The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.

**USER**
The profile of the user running the program or SQL package is used.

**OWNER**
The user profiles of both the owner and the user are used when the program or SQL package is run.

Dynamic user profile (DYNUSRPRF)

Specifies the user profile used for dynamic SQL statements.

**USER**
Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

**OWNER**
Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

Sort sequence (SRTSEQ)

Specifies the sort sequence table to be used for string comparisons in SQL statements.

Note: *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

Single values

**JOB**
The SRTSEQ value for the job is used.

**JOBRUN**
The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.

**LANGIDUNQ**
The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.

**LANGIDSHR**
The shared-weight sort table for the language specified for the LANGID parameter is used.

**HEX**
A sort sequence table is not used. The hexadecimal values of the characters are used to determine the sort sequence.
Qualifier 1: Sort sequence
name  Specify the name of the sort sequence table to be used with this program.

Qualifier 2: Library
*LIBL  All libraries in the job's library list are searched until the first match is found.
*CURLIB  The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.
name  Specify the name of the library to be searched.

Language id (LANGID)
Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.
*JOB  The LANGID value for the job is retrieved during the precompile.
*JOBRUN  The LANGID value for the job is retrieved when the program is run. For distributed applications, LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.
language-id  Specify the language identifier to be used by the program.

To source file (TOSRCFILE)
Specifies the source file that is to contain the output source member that has been processed by the SQL precompiler. If the specified source file is not found, it will be created. The output member will have the same name as the name specified for the SRCMBR parameter.

Qualifier 1: To source file
QSQLTEMP  The source file QSQLTEMP will be used.
name  Specify the name of the source file to contain the output source member.

Qualifier 2: Library
QTEMP  The library QTEMP will be used.
*LIBL  The job's library list is searched for the specified file. If the file is not found in any library in the library list, the file will be created in the current library.
*CURLIB  The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.
name  Specify the name of the library that is to contain the output source file.
Decimal result options (DECRESULT)

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

Element 1: Maximum precision

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>The maximum precision (length) that should be returned for the result data types is 31 digits.</td>
</tr>
<tr>
<td>63</td>
<td>The maximum precision (length) that should be returned for the result data types is 63 digits.</td>
</tr>
</tbody>
</table>

Element 2: Maximum scale

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.</td>
</tr>
<tr>
<td>0-63</td>
<td>Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.</td>
</tr>
</tbody>
</table>

Element 3: Minimum divide scale

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.</td>
</tr>
<tr>
<td>0-9</td>
<td>Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot to exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.</td>
</tr>
</tbody>
</table>

Compiler options (COMPILEOPT)

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

*NONE

No additional parameters will be used on the compiler command.

c character-value

Specify no more than 5000 characters, enclosed in apostrophes.

Examples

CRTSQLCBL  PGM(ACCTS/STATS) SRCFILE(ACCTS/ACTIVE)
            TEXT('Statistical analysis of active accounts')

This command runs the SQL precompiler which precompiles the COBOL source and stores the changed source in member STATS of source file QSQLTEMP in library QTEMP. The COBOL compiler is called to create program STATS in library ACCTS using the source member created by the SQL precompiler.
**Error messages**

*ESCAPE Messages*

**SQL9001**
SQL precompile failed.

**SQL9002**
Conflict in TGTRLS parameters for SQL precompile and &7 compile.

**SQL9003**
&7 Compile at wrong level for SQL source.

**SQL9004**
Create of SQL package failed.

**SQL9006**
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Create SQL ILE COBOL Object (CRTSQLCBLI)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Create SQL ILE COBOL Object (CRTSQLCBLI) command calls the Structured Query Language (SQL) precompiler which precompiles COBOL source containing SQL statements, produces a temporary source member, and then optionally calls the ILE COBOL for iSeries compiler to create a module, create a program, or create a service program.

Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJ</td>
<td>Object</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Object</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Source file</td>
<td>Name, QCBLLESRC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *OBJ</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>OBJTYPE</td>
<td>Compile type</td>
<td>*PGM, *SRVPGM, *MODULE</td>
<td>Optional</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>Listing output</td>
<td>*NONE, *PRINT</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text ‘description’</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, X’40’</td>
<td>Optional</td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSQLCSR</td>
<td>Close SQL cursor</td>
<td>*ENDACTGRP, *ENDMOD</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, /, -, X’40’, *BLANK</td>
<td>Optional</td>
</tr>
</tbody>
</table>
###Object (OBJ)

Specifies the object to be created.

This is a required parameter.

**Qualifier 1: Object**

*name*  Specify the name of the object to be created.

**Qualifier 2: Library**

---

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TIMSEP</strong></td>
<td>Time separator character</td>
<td>*JOB, ., ,, X'40', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>REPLACE</strong></td>
<td>Replace</td>
<td>*YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>RDBCNNMTH</strong></td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>DFTRDBCOL</strong></td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>DYNDFTCOL</strong></td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>SQLPKG</strong></td>
<td>Package</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Package</td>
<td>Name, *OBJ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *OBJLIB</td>
<td></td>
</tr>
<tr>
<td><strong>SQLPATH</strong></td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Other values (up to 268 repetitions): Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SQLCURRULE</strong></td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>SAAFLAG</strong></td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>FLAGSTD</strong></td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>PRTFILE</strong></td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Print file</td>
<td>Name, *QSYSPRT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td><strong>DBGVIEW</strong></td>
<td>Debugging view</td>
<td>*NONE, *SOURCE</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>USRPRF</strong></td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>DYNUSRPRF</strong></td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Other values: Qualified object name</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Sort sequence</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td><strong>LANGID</strong></td>
<td>Language id</td>
<td>Character value, *JOB, *JBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>TOSRCFILE</strong></td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: To source file</td>
<td>Name, *QSYLTEMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *QTEMP, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td><strong>DECRESULT</strong></td>
<td>Decimal result options</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Element 1: Maximum precision</td>
<td>31, 63</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 2: Maximum scale</td>
<td>0-63, 31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 3: Minimum divide scale</td>
<td>0-9, 0</td>
<td></td>
</tr>
<tr>
<td><strong>COMPILEOPT</strong></td>
<td>Compiler options</td>
<td>Character value, *NONE</td>
<td>Optional</td>
</tr>
</tbody>
</table>
The new object is created in the current library for the job. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the object is created.

Source file (SRCFILE)

Specifies the source file that contains the COBOL source statements and SQL statements.

Qualifier 1: Source file

QCBLLESRC

Source file QCBLLESRC contains the COBOL source.

name Specify the name of the source file that contains the COBOL source. This source file should have a record length of 92. The source file can be a database file, device file, or an inline data file.

Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.

*CURLIB The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library to be searched.

Source member (SRCMBR)

Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the Source file (SRCFILE) parameter is a database file.

*OBJ The source file member that has the same name as the value specified for the Object (OBJ) parameter contains the input source.

name Specify the name of the source file member that contains the input source.

Commitment control (COMMIT)

Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are
locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or *RS
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC
Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

Relational database (RDB)

Specifies the name of the relational database where the SQL package is to be created.

*LOCAL
The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE
An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name
Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

Compile type (OBJTYPE)

Specifies the type of object to be created.

When OBJTYPE(*PGM) or OBJTYPE(*SRVPGM) is specified and the RDB parameter is also specified, the CRTSQLPKG command is issued by the SQL precompiler after the program has been created. When OBJTYPE(*MODULE) is specified, an SQL package is not created and you must issue the CRTSQLPKG command after the CRTPGM or CRTSRVPGM command has created the program.

If OPTION(*NOGEN) is specified, only the SQL temporary source member is generated. No module, program, service program, or SQL package is created.

*PGM
The SQL precompiler calls the compiler to create a program.

*MODULE
The SQL precompiler calls the compiler to create a module.
*SRVPGM

The SQL precompiler calls the compiler to create a module and issues the Create Service Program (CRTSRVPGM) command to create a service program.

Listing output (OUTPUT)

Specifies whether the precompiler listing is generated.

*NONE
   The precompiler listing is not generated.

*PRINT
   The precompiler listing is generated.

Text ’description’ (TEXT)

Specifies text that briefly describes the program and its function.

*SRCMBRTXT
   The text is taken from the source file member being used to create the program. If the source file is an inline file or a device file, the text is blank.

*BLANK
   No text is specified.

’description’
   Specify no more than 50 characters, enclosed in apostrophes.

RDB user (USER)

Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

*CURRENT
   The user name associated with the current job is used.

name
   Specify the user name to be used for the application server job.

RDB user password (PASSWORD)

Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.

*NONE
   No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this value is specified.

   Note: Specifying a password of a blank is the same as specifying *NONE.

password
   Specify the password of the user name specified for the USER parameter.
Precompiler options (OPTION)

Specifies whether one or more of the following options are used when the COBOL source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

Cross reference options:

*XREF The precompiler cross-references items in the program to the statement numbers in the program that refer to those items.

*NOXREF The precompiler does not cross-reference names.

Program creation options:

*GEN The precompiler creates the object that is specified for the OBJTYPE parameter.

*NOGEN The precompiler does not call the ILE COBOL compiler. No module, program, service program, or SQL package is created.

Decimal point options:

*JOB The representation for the decimal point specified for the job at precompile time is used.

Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1, 2,23, 4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

*SYSVAL The value used as the decimal point in numeric constants is from the QDECFMT system value. This value is also used as the decimal point character when casting a numeric value to character.

Note: If QDECFMT specifies that the value used as the decimal point is a comma; any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1, 2,23, 4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

*PERIOD The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

*COMMA The value used as the decimal point in numeric constants is a comma. Any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1, 2,23, 4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

Naming convention options:

*SYS Specifies that the system naming convention is used (library-name/file-name).

*SQL Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the Relational database (RDB) parameter, and the database is on a system that is not an iSeries system, *SQL must be specified as the naming convention.
Second-level message text options:

*NOSECLVL
Second-level text descriptions are not added to the listing.

*SECLVL
Second-level text with replacement data is added for all messages on the listing.

SQL string delimiter options:

*QUOTESQL
The character used as the string delimiter in the SQL statements is the quote ("").

*APOSTSQL
The character used as the string delimiter in the SQL statements is the apostrophe (').

COBOL string delimiter options:

*QUOTE
The character used for nonnumeric literals and Boolean literals in the COBOL statements is the quote ("").

*APOST
The character used for nonnumeric literals and Boolean literals in the COBOL statements is the apostrophe (').

LOB optimization for DRDA options:

*OPTLOB
The first FETCH for a cursor determines how the cursor will be used for LOBs (Large Objects) on all subsequent FETCHes. This option remains in effect until the cursor is closed.

If the first FETCH uses a LOB locator to access a LOB column, no subsequent FETCH for that cursor can fetch that LOB column into a LOB host variable.

If the first FETCH places the LOB column into a LOB host variable, no subsequent FETCH for that cursor can use a LOB locator for that column.

*NOOPTLOB
There is no restriction on whether a column is retrieved into a LOB locator or into a LOB host variable. This option can cause performance to degrade.

Event file creation options:

*NOEVENTF
The compiler will not produce an event file for use by CoOperative Development Environment (CODE).

*EVENTF
The compiler produces an event file for use by CoOperative Development Environment (CODE). The event file will be created as a member in the file EVFEVENT in your object library. CODE uses this file to offer error feedback integrated with the CODE editor. This option is normally specified by CODE on your behalf.

Character string representations options:

*NOCVTDT
Specifies that date, time, and timestamp data types which are retrieved from externally-described database files are to be processed using the date, time, and timestamp data types.

*CVTDT
Specifies that date, time and timestamp data types, which are retrieved from externally-described database files, are to be processed as fixed-length character fields.
**Target release (TGTRLS)***

Specifies the release of the operating system on which you intend to use the object being created.

When specifying the target-release value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT  
The object is to be used on the release of the operating system currently running on your system.  
The object can also be used on a system with any subsequent release of the operating system installed.

*PRV  
The object is to be used on the previous release with modification level 0 of the operating system.  
The object can also be used on a system with any subsequent release of the operating system installed.

**INCLUDE file (INCFILE)***

Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

**Single values**

*SRCFILE  
The qualified source file you specify for the Source file (SRCFILE) parameter contains the source file members specified on any SQL INCLUDE statements.

**Qualifier 1: INCLUDE file**

*name  
Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the Source file (SRCFILE) parameter.

**Qualifier 2: Library**

*LIBL  
All libraries in the job’s library list are searched until the first match is found.

*CURLIB  
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

*name  
Specify the name of the library where the source file is located.
Allow copy of data (ALWCPYDTA)

Specifies whether a copy of the data can be used in a SELECT statement.

*OPTIMIZE

The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

*YES  A copy of the data is used only when necessary.

*NO  A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQLCRS)

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released. SQL cursors are explicitly closed when the user issues the CLOSE, COMMIT, or ROLLBACK (without HOLD) SQL statements.

*ENDACTGRP

SQL cursors are closed and SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released when the activation group ends.

*ENDMOD

SQL cursors are closed and SQL prepared statements are implicitly discarded when the module is exited. LOCK TABLE locks are released when the first SQL program on the call stack ends.

Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.

*ALLREAD

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying *ALLREAD:

• Allows record blocking for all read-only cursors.
• Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  – The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
  – Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

*NONE

Rows are not blocked for retrieval of data for cursors.
Specifying *NONE:
  • Guarantees that the data retrieved is current.
  • May reduce the amount of time required to retrieve the first row of data for a query.
  • Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
  • Can degrade the overall performance of a query that retrieves a large number of rows.

*READ
Records are blocked for read-only retrieval of data for cursors when:
  • *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
  • The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

---

Delay PREPARE (DLYPRP)

Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

*NO Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

*YES Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

Note: If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.

---

Severity level (GENLVL)

Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.

If the Relational database (RDB) parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.

10 Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated.

0–40 Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called.
Date format (DATFMT)

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

Note: An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA The United States date format mm/dd/yyyy is used.

*ISO The International Organization for Standardization (ISO) date format yyyy-mm-dd is used.

*EUR The European date format dd.mm.yyyy is used.

*JIS The Japanese Industrial Standard date format yyyy-mm-dd is used.

*MDY The date format mm/dd/yy is used.

*DMY The date format dd/mm/yy is used.

*YMD The date format yyy-mm-dd is used.

*JUL The Julian date format yy/ddd is used.

Date separator character (DATSEP)

Specifies the separator to be used when accessing date result columns.

Note: This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the Date format (DATFMT) parameter.

*JOB The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

’/’ A slash is used as the date separator.

’.’ A period is used as the date separator.

’-’ A dash is used as the date separator.

’,’ A comma is used as the date separator.

’ ’ or *BLANK A blank is used as the date separator.
**Time format (TIMFMT)**

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS  The hh:mm:ss format is used.

*USA  The United States time format hh:mmxx is used, where xx is AM or PM.

*ISO  The International Organization for Standardization (ISO) time format hh.mm.ss is used.

*EUR  The European time format hh.mm.ss is used.

*JIS  The Japanese Industrial Standard time format hh:mm:ss is used.

---

**Time separator character (TIMSEP)**

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

*JOB  The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

`:`  A colon is used as the time separator.

`.`  A period is used as the time separator.

`,`  A comma is used as the time separator.

``  or *BLANK  A blank is used as the time separator.

---

**Replace (REPLACE)**

Specifies if a SQL module, program, service program or package is created when there is an existing SQL module, program, service program, or package of the same name and type in the same library. The value for this parameter is passed to the CRTCLMOD, CRTBNDCBL, CRTSRVPGM, and CRTSQLPKG commands.

*YES  A new SQL module, program, service program, or package is created, any existing SQL object of the same name and type in the specified library is moved to QRPLOBJ.

*NO  A new SQL module, program, service program, or package is not created if an SQL object of the same name and type already exists in the specified library.
RDB connect method (RDBCNNMTH)

Specifies the semantics used for CONNECT statements.

*DUW
CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW
CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

Default collection (DFTRDBCOL)

Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE
The naming convention specified for the Precompiler options (OPTION) parameter is used.

name
Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

Dynamic default collection (DYNDFTCOL)

Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.

*NO
Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.

*YES
The schema name specified for the DFTRDBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.

Package (SQLPKG)

Specifies the qualified name of the SQL package created on the relational database specified for the RDB parameter of this command.

Qualifier 1: Package

*OBJ
The name of the SQL package is the same as the object name specified for the OBJ parameter.

name
Specify the name of the SQL package. If the remote system is not an iSeries system, no more than 8 characters can be specified.

Qualifier 2: Library
*OBJLIB

The package is created in the library with the same name as the library specified for the OBJ parameter.

name Specify the name of the library where the package is created.

---

SQL path (SQLPATH)

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

*NAMING

The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

*LIBL The path used is the library list at runtime.

name Specify one or more schema names. A maximum of 268 schema names may be specified.

---

SQL rules (SQLCURRULE)

Specifies the semantics used for SQL statements.

*DB2 The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

Hexadecimal constants are treated as character data.

*STD The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:

Hexadecimal constants are treated as binary data.

---

IBM SQL flagging (SAAFLAG)

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG No checks are made to see whether SQL statements conform to IBM SQL syntax.

*FLAG Checks are made to see whether SQL statements conform to IBM SQL syntax.
**ANS flagging (FLAGSTD)**

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE  
No checks are made to see whether SQL statements conform to ANSI standards.
*ANS  
Checks are made to see whether SQL statements conform to standards.

**Print file (PRTFILE)**

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

**QSYSPRT**

The precompiler output file is directed to the IBM-supplied printer file, QSYSPRT. The file QSYSPRT has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

**name**  
Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIBL  
All libraries in the job’s library list are searched until the first match is found.
*CURLIB  
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

**name**  
Specify the name of the library where the printer file is located.

**Debugging view (DBGVIEW)**

Specifies the type of source debug information to be provided by the SQL precompiler.

*NONE  
The source view will not be generated.

*SOURCE  
The SQL precompiler will provide the source views for the root and if necessary, SQL INCLUDE statements. A view is to be provided which contains the statements generated by the precompiler.

**User profile (USRPRF)**

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

*NAMING  
The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.
**USER**

The profile of the user running the program or SQL package is used.

**OWNER**

The user profiles of both the owner and the user are used when the program or SQL package is run.

---

**Dynamic user profile (DYNUSRPRF)**

Specifies the user profile used for dynamic SQL statements.

**USER**

Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

**OWNER**

Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

---

**Sort sequence (SRTSEQ)**

Specifies the sort sequence table to be used for string comparisons in SQL statements.

**Note:** *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

**Single values**

**JOB**

The SRTSEQ value for the job is used.

**JOBRUN**

The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.

**LANGIDUNQ**

The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.

**LANGIDSHR**

The shared-weight sort table for the language specified for the LANGID parameter is used.

**HEX**

A sort sequence table is not used. The hexadecimal values of the characters are used to determine the sort sequence.

**Qualifier 1: Sort sequence**

**name**

Specify the name of the sort sequence table to be used with this program.

**Qualifier 2: Library**

**LIBL**

All libraries in the job’s library list are searched until the first match is found.

**CURLIB**

The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

**name**

Specify the name of the library to be searched.
Language id (LANGID)

Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.

*JOB
The LANGID value for the job is retrieved during the precompile.

*JOBRUN
The LANGID value for the job is retrieved when the program is run. For distributed applications, LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.

 language-id
Specify the language identifier to be used by the program.

To source file (TOSRCFILE)

Specifies the source file that is to contain the output source member that has been processed by the SQL precompiler. If the specified source file is not found, it will be created. The output member will have the same name as the name specified for the SRCMBR parameter.

Qualifier 1: To source file

QSQLTEMP
The source file QSQLTEMP will be used.

name Specify the name of the source file to contain the output source member.

Qualifier 2: Library

QTEMP
The library QTEMP will be used.

*LIBL The job’s library list is searched for the specified file. If the file is not found in any library in the library list, the file will be created in the current library.

*CURLIB
The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library that is to contain the output source file.

Decimal result options (DECRESULT)

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

Element 1: Maximum precision

31 The maximum precision (length) that should be returned for the result data types is 31 digits.

63 The maximum precision (length) that should be returned for the result data types is 63 digits.
Element 2: Maximum scale

31 The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.

0-63 Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.

Element 3: Minimum divide scale

0 The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.

0-9 Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot to exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.

Compiler options (COMPILEOPT)

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. If INCDIR is anywhere in the string, the precompiler will call the compiler using the SRCSTMF parameter. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

*NONE No additional parameters will be used on the compiler command.

character-value Specify no more than 5000 characters, enclosed in apostrophes.

Examples

CRTSQLCBLI OBJ(PAYROLL) OBJTYPE(*MODULE)
TEXT('Payroll Program')

This command runs the SQL precompiler which precompiles the COBOL source and stores the changed source in member PAYROLL of source file QSQLTEMP in library QTEMP. The ILE COBOL compiler is called to create module PAYROLL in the current library by using the source member created by the SQL precompiler.

Error messages

*ESCAPE Messages

SQL9001 SQL precompile failed.
SQL9002
Conflict in TGTRLS parameters for SQL precompile and &7 compile.

SQL9003
&7 Compile at wrong level for SQL source.

SQL9004
Create of SQL package failed.

SQL9006
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Create SQL ILE C object (CRTSQLCI)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Create SQL ILE C Object (CRTSQLCI) command calls the Structured Query Language (SQL) precompiler which precompiles C source containing SQL statements, produces a temporary source member, and then optionally calls the ILE C compiler to create a module, create a program, or create a service program.

Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJ</td>
<td>Object</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td>Qualifier 1: Object</td>
<td>Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td>Qualifier 1: Source file</td>
<td>Name, QCSRC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *OBJ</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>OBJTYPE</td>
<td>Compile type</td>
<td>*MODULE, *PGM, *SRVPGM</td>
<td>Optional</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>Listing output</td>
<td>*NONE, *PRINT</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text ‘description’</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, ‘ ’</td>
<td>Optional</td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSQLCIR</td>
<td>Close SQL cursor</td>
<td>*ENDACTGRP, *ENDMOD</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>MARGINS</td>
<td>Source margins</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td>Element 1: Left margin</td>
<td>1-32754, *SRCFILE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element 2: Right margin</td>
<td>1-32754</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyword</td>
<td>Description</td>
<td>Choices</td>
<td>Notes</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, '/', ',', ' ', ' ', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, ',', ',', ',', ' ', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Replace</td>
<td>*YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>RDBCNMNTH</td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td>DFTDRCOL</td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNDFDTCOL</td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPKG</td>
<td>Package</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: Package</td>
<td>Name, *OBJ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *OBJLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQLPATH</td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: Print file</td>
<td>Name, QYS PSRT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQLCURRULE</td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td>SAAFLAG</td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td>FLAGSTD</td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td>PRTFILE</td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: Print file</td>
<td>Name, QYS PSRT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBGVIEW</td>
<td>Debugging view</td>
<td>*NONE, *SOURCE</td>
<td>Optional</td>
</tr>
<tr>
<td>USRPREF</td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNUSRPREF</td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: Sort sequence</td>
<td>Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LANGID</td>
<td>Language id</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>TOSRCFILE</td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: To source file</td>
<td>Name, *CALC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *TEMP, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DECREULT</td>
<td>Decimal result options</td>
<td>*Element list</td>
<td>Optional</td>
</tr>
<tr>
<td>Element 1: Maximum precision</td>
<td>31, 63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element 2: Maximum scale</td>
<td>0-63, 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element 3: Minimum divide scale</td>
<td>0-9, 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMPILEOPT</td>
<td>Compiler options</td>
<td>Character value, *NONE</td>
<td>Optional</td>
</tr>
</tbody>
</table>

**Object (OBJ)**

Specifies the object to be created.

This is a required parameter.

**Qualifier 1: Object**
name Specify the name of the object to be created.

Qualifier 2: Library

*CURLIB
The new object is created in the current library for the job. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the object is created.

Source file (SRCFILE)
Specifies the source file that contains the C source statements and SQL statements.

Qualifier 1: Source file

QCSRC
Source file QCSRC contains the C source.

name Specify the name of the source file that contains the C source. The source file can be a database file, device file, or an inline data file.

Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.

*CURLIB
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library to be searched.

Source member (SRCMBR)
Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the Source file (SRCFILE) parameter is a database file.

*OBJ
The source file member that has the same name as the value specified for the Object (OBJ) parameter contains the input source.

name Specify the name of the source file member that contains the input source.

Commitment control (COMMIT)
Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.
*CS  Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or *RS  Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC  Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR  Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

---

**Relational database (RDB)**

Specifies the name of the relational database where the SQL package is to be created.

*LOCAL  The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE  An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name  Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

---

**Compile type (OBJTYPE)**

Specifies the type of object to be created.

When OBJTYPE(*PGM) or OBJTYPE(*SRVPGM) is specified and the RDB parameter is also specified, the CRTSQLPKG command is issued by the SQL precompiler after the program has been created. When OBJTYPE(*MODULE) is specified, an SQL package is not created and you must issue the CRTSQLPKG command after the CRTPGM or CRTSRVPGM command has created the program.

If OPTION(*NOGEN) is specified, only the SQL temporary source member is generated. No module, program, service program, or SQL package is created.

*PGM  The SQL precompiler calls the compiler to create a program.
*MODULE

The SQL precompiler calls the compiler to create a module.

*SRVPGM

The SQL precompiler calls the compiler to create a module and issues the Create Service Program (CRTSRVPGM) command to create a service program.

Note: If *SRVPGM is specified, there must be a source member in source file QSRVSRC that has the same name as the name specified for the OBJ parameter. The source member must contain the export information for the module.

Listing output (OUTPUT)

Specifies whether the precompiler listing is generated.

*NONE

The precompiler listing is not generated.

*PRINT

The precompiler listing is generated.

Text ’description’ (TEXT)

Specifies text that briefly describes the program and its function.

*SRCMBRTXT

The text is taken from the source file member being used to create the program. If the source file is an inline file or a device file, the text is blank.

*BLANK

No text is specified.

’description’

Specify no more than 50 characters, enclosed in apostrophes.

RDB user (USER)

Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

*CURRENT

The user name associated with the current job is used.

name

Specify the user name to be used for the application server job.

RDB user password (PASSWORD)

Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.
*NONE

No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this value is specified.

Note: Specifying a password of a blank is the same as specifying *NONE.

_password_

Specify the password of the user name specified for the USER parameter.

---

**Precompiler options (OPTION)**

Specifies whether one or more of the following options are used when the C source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

**Cross reference** options:

* **XREF** The precompiler cross-references items in the program to the statement numbers in the program that refer to those items.

* **NOXREF** The precompiler does not cross-reference names.

**Program creation** options:

* **GEN** The precompiler creates the object that is specified for the OBJTYPE parameter.

* **NOGEN** The precompiler does not call the ILE C compiler, and a module, program, service program, or SQL package is not created.

**Decimal point** options:

* **PERIOD** The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

* **JOB** The representation for the decimal point specified for the job at precompile time is used.

  Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, \VALUES(1.1, 2,23, 4,1) \equal{} \VALUES(1.1,2.23,4.1) in which the decimal point is a period.

* **SYSVAL** The value used as the decimal point is the QDECFMT system value.

  Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, \VALUES(1,1, 2,23, 4,1) \equal{} \VALUES(1.1,2.23,4.1) in which the decimal point is a period.

* **COMMA** The value used as the decimal point is a comma.

  Note: Any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, \VALUES(1,1, 2,23, 4,1) \equal{} \VALUES(1.1,2.23,4.1) where the decimal point is a period.

**Naming convention** options:
*SYS Specifies that the system naming convention is used (library-name/file-name).

*SQL Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the **Relational database (RDB)** parameter, and the database is on a system that is not an iSeries system, *SQL must be specified as the naming convention.

**Second-level message text options:**

*NOSECLVL Second-level text descriptions are not added to the listing.

*SECLVL Second-level text with replacement data is added for all messages on the listing.

**NUL required options:**

*NOCNULRQD For output character and graphic host variables, the NUL-terminator is not returned when the host variable is exactly the same length as the data. Input character and graphic host variables do not require a NUL-terminator.

*CNULRQD Output character and graphic host variables always contain the NUL-terminator. If there is not enough space for the NUL-terminator, the data is truncated and the NUL-terminator is added. Input character and graphic host variables require a NUL-terminator.

**LOB optimization for DRDA options:**

*OPTLOB The first FETCH for a cursor determines how the cursor will be used for LOBs (Large Objects) on all subsequent FETCHes. This option remains in effect until the cursor is closed.

If the first FETCH uses a LOB locator to access a LOB column, no subsequent FETCH for that cursor can fetch that LOB column into a LOB host variable.

If the first FETCH places the LOB column into a LOB host variable, no subsequent FETCH for that cursor can use a LOB locator for that column.

*NOOPTLOB There is no restriction on whether a column is retrieved into a LOB locator or into a LOB host variable. This option can cause performance to degrade.

**Event file creation options:**

*NOEVENTF The compiler will not produce an event file for use by CoOperative Development Environment (CODE).

*EVENTF The compiler produces an event file for use by CoOperative Development Environment (CODE). The event file will be created as a member in the file EVFEVENT in your object library. CODE uses this file to offer error feedback integrated with the CODE editor. This option is normally specified by CODE on your behalf.

**Target release (TGTRLS)**

Specifies the release of the operating system on which you intend to use the object being created.
When specifying the **target-release** value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT
The object is to be used on the release of the operating system currently running on your system. The object can also be used on a system with any subsequent release of the operating system installed.

*PRV
The object is to be used on the previous release with modification level 0 of the operating system. The object can also be used on a system with any subsequent release of the operating system installed.

**target-release**
Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

---

**INCLUDE file (INCFILE)**

Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

**Single values**

*SRCFILE
The qualified source file you specify for the **Source file (SRCFILE)** parameter contains the source file members specified on any SQL INCLUDE statements.

**Qualifier 1: INCLUDE file**

**name**
Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the **Source file (SRCFILE)** parameter.

**Qualifier 2: Library**

*LIBL
All libraries in the job’s library list are searched until the first match is found.

*CURLIB
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

**name**
Specify the name of the library where the source file is located.

---

**Allow copy of data (ALWCPYDTA)**

Specifies whether a copy of the data can be used in a SELECT statement.
The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

A copy of the data is used only when necessary.

A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQLCsr)

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released. SQL cursors are explicitly closed when the user issues the CLOSE, COMMIT, or ROLLBACK (without HOLD) SQL statements.

SQL cursors are closed and SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released when the activation group ends.

SQL cursors are closed and SQL prepared statements are implicitly discarded when the module is exited. LOCK TABLE locks are released when the first SQL program on the call stack ends.

Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying *ALLREAD:

- Allows record blocking for all read-only cursors.
- Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  - The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
  - Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

Rows are not blocked for retrieval of data for cursors.

Specifying *NONE:

- Guarantees that the data retrieved is current.
- May reduce the amount of time required to retrieve the first row of data for a query.
• Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
• Can degrade the overall performance of a query that retrieves a large number of rows.

**READ**
Records are blocked for read-only retrieval of data for cursors when:
• *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
• The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

---

**Delay PREPARE (DLYPRP)**
Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

**NO** Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

**YES** Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

**Note:** If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.

---

**Severity level (GENLVL)**
Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.

If the Relational database (RDB) parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.

**10** Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated.

**0-40** Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called.
Source margins (MARGINS)

Specifies the part of the precompiler input record that contains source text.

Element 1: Left margin

*SRCFILE

The left margin will be set to 1 and the right margin will be set to the record length of the input source file.

1-32754

Specify the beginning position to be used for each input record.

Element 2: Right margin

1-32754

Specify the ending position to be used for each input record.

Date format (DATFMT)

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

Note: An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA The United States date format mm/dd/yyyy is used.

*ISO The International Organization for Standardization (ISO) date format yyyy-mm-dd is used.

*EUR The European date format dd.mm.yyyy is used.

*JIS The Japanese Industrial Standard date format yyyy-mm-dd is used.

*MDY The date format mm/dd/yy is used.

*DMY The date format dd/mm/yy is used.

*YMD The date format yy/mm/dd is used.

*JUL The Julian date format yy/ddd is used.

Date separator character (DATSEP)

Specifies the separator to be used when accessing date result columns.

Note: This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the Date format (DATFMT) parameter.
*JOB  The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

'/ ' A slash is used as the date separator.

'.' A period is used as the date separator.

'- ' A dash is used as the date separator.

'' A comma is used as the date separator.

'' or *BLANK
A blank is used as the date separator.

---

**Time format (TIMFMT)**

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS  The hh:mm:ss format is used.

*USA  The United States time format hh:mmxx is used, where xx is AM or PM.

*ISO  The International Organization for Standardization (ISO) time format hh.mm.ss is used.

*EUR  The European time format hh.mm.ss is used.

*JIS  The Japanese Industrial Standard time format hh:mm:ss is used.

---

**Time separator character (TIMSEP)**

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

*JOB  The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

':' A colon is used as the time separator.

'.' A period is used as the time separator.

',' A comma is used as the time separator.

' ' or *BLANK
A blank is used as the time separator.
Replace (REPLACE)
Specifies if a SQL module, program, service program or package is created when there is an existing SQL module, program, service program, or package of the same name and type in the same library. The value for this parameter is passed to the CRTCMOD, CRTBNDC, CRTSRVPGM, and CRTSQLPKG commands.

*YES A new SQL module, program, service program, or package is created, and any existing object of the same name and type in the specified library is moved to QRPLOBJ.

*NO A new SQL module, program, service program, or package is not created if an object of the same name and type already exists in the specified library.

RDB connect method (RDBCNNMTH)
Specifies the semantics used for CONNECT statements.

*DUW CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

Default collection (DFTRDBCOL)
Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE The naming convention specified for the Precompiler options (OPTION) parameter is used.

name Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

Dynamic default collection (DYNDFTCOL)
Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.

*NO Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.
The schema name specified for the DFTRDBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.

**Package (SQLPKG)**

Specifies the qualified name of the SQL package created on the relational database specified for the RDB parameter of this command.

**Qualifier 1: Package**

*OBJ  The name of the SQL package is the same as the object name specified for the OBJ parameter.

name  Specify the name of the SQL package. If the remote system is not an iSeries system, no more than 8 characters can be specified.

**Qualifier 2: Library**

*OBJLIB  The package is created in the library with the same name as the library specified for the OBJ parameter.

name  Specify the name of the library where the package is created.

**SQL path (SQLPATH)**

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

**NAMING**

The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For *SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

*LIBL  The path used is the library list at runtime.

name  Specify one or more schema names. A maximum of 268 schema names may be specified.

**SQL rules (SQLCURRULE)**

Specifies the semantics used for SQL statements.

*DB2  The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

  Hexadecimal constants are treated as character data.

*STD  The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:
Hexadecimal constants are treated as binary data.

**IBM SQL flagging (SAAFLAG)**

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG*

No checks are made to see whether SQL statements conform to IBM SQL syntax.

*FLAG*

Checks are made to see whether SQL statements conform to IBM SQL syntax.

**ANS flagging (FLAGSTD)**

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE*

No checks are made to see whether SQL statements conform to ANSI standards.

*ANS*

Checks are made to see whether SQL statements conform to standards.

**Print file (PRTFILE)**

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

QSYSPRT

The precompiler output file is directed to the IBM-supplied printer file, QSYSPRT. The file QSYSPRT has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

name Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIBL*

All libraries in the job's library list are searched until the first match is found.

*CURLIB*

The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the printer file is located.

**Debugging view (DBGVIEW)**

Specifies the type of source debug information to be provided by the SQL precompiler.
*NONE
The source view will not be generated.

*SOURCE
The SQL precompiler will provide the source views for the root and if necessary, SQL INCLUDE statements. A view is to be provided which contains the statements generated by the precompiler.

User profile (USRPRF)
Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

*NAMING
The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.

*USER
The profile of the user running the program or SQL package is used.

*OWNER
The user profiles of both the owner and the user are used when the program or SQL package is run.

Dynamic user profile (DYNUSRPRF)
Specifies the user profile used for dynamic SQL statements.

*USER
Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

*OWNER
Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

Sort sequence (SRTSEQ)
Specifies the sort sequence table to be used for string comparisons in SQL statements.

Note: *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

Single values

*JOB The SRTSEQ value for the job is used.

*JOBRUN
The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.
*LANGIDUNQ
   The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.

*LANGIDSHR
   The shared-weight sort table for the language specified for the LANGID parameter is used.

*HEX
   A sort sequence table is not used. The hexadecimal values of the characters are used to determine the sort sequence.

Qualifier 1: Sort sequence
   name Specify the name of the sort sequence table to be used with this program.

Qualifier 2: Library
   *LIBL All libraries in the job's library list are searched until the first match is found.
   *CURLIB The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.
   name Specify the name of the library to be searched.

Language id (LANGID)
   Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.
   *JOB The LANGID value for the job is retrieved during the precompile.
   *JOBRUN The LANGID value for the job is retrieved when the program is run. For distributed applications, LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.
   language-id Specify the language identifier to be used by the program.

To source file (TOSRCFILE)
   Specifies the source file that is to contain the output source member that has been processed by the SQL precompiler. If the specified source file is not found, it will be created. The output member will have the same name as the name specified for the SRCMBR parameter.

Qualifier 1: To source file
   *CALC The output source file name will be generated based on the margins of the source file. The name will be QSQLTxxxxx, where xxxxx is the width of the source file. If the source file record length is less than or equal to 92, the name will be QSQLTEMP.
   name Specify the name of the source file to contain the output source member.

Qualifier 2: Library
   QTEMP The library QTEMP will be used.
*LIBL  The job’s library list is searched for the specified file. If the file is not found in any library in the library list, the file will be created in the current library.

*CURLIB  The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.

name  Specify the name of the library that is to contain the output source file.

---

**Decimal result options (DECRESULT)**

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

**Element 1: Maximum precision**

31  The maximum precision (length) that should be returned for the result data types is 31 digits.
63  The maximum precision (length) that should be returned for the result data types is 63 digits.

**Element 2: Maximum scale**

31  The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.
0-63  Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.

**Element 3: Minimum divide scale**

0  The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.
0-9  Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot to exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.

---

**Compiler options (COMPILEOPT)**

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. If INCDIR is anywhere in the string, the precompiler will call the compiler using the SRCSTMF parameter. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

*NONE  No additional parameters will be used on the compiler command.

character-value  Specify no more than 5000 characters, enclosed in apostrophes.
Examples

CRTSQLCI OBJ(PAYROLL) OBJTYPE(*MODULE)
   TEXT('Payroll Program')

This command runs the SQL precompiler which precompiles the C source and stores the changed source in member PAYROLL of source file QSQLTEMP in library QTEMP. The ILE C compiler is called to create module PAYROLL in the current library by using the source member created by the SQL precompiler.

Error messages

*ESCAPE Messages

SQL9001
SQL precompile failed.

SQL9002
Conflict in TGTRLS parameters for SQL precompile and &7 compile.

SQL9003
&7 Compile at wrong level for SQL source.

SQL9004
Create of SQL package failed.

SQL9006
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Create SQL ILE C++ Object (CRTSQLCPPI)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Create SQL ILE C++ Object (CRTSQLCPPI) command calls the Structured Query Language (SQL) precompiler which precompiles C++ source containing SQL statements, produces a temporary source member, and then optionally calls the ILE C++ compiler to create a module.

Since this command only creates a module, the user must issue the CRTSQLPKG command after the CRTPGM or CRTSRVPGM command has created the program if an SQL package is needed.

### Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJ</td>
<td>Object</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Object</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Source file</td>
<td>Name, QCSRC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *OBJ</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>Listing output</td>
<td>*NONE, *PRINT</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text 'description'</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, 'X'40'</td>
<td>Optional</td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSOLCSR</td>
<td>Close SQL cursor</td>
<td>*ENDACTGRP, *ENDMOD</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>Keyword</td>
<td>Description</td>
<td>Choices</td>
<td>Notes</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------</td>
<td>---------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>MARGINS</td>
<td>Source margins</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Element 1: Left margin</td>
<td>1-32754, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 2: Right margin</td>
<td>1-32754</td>
<td></td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, /, ., ., ., X'40', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, /, ., ., X'40', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Replace</td>
<td>*YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>RDBCNNMTH</td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td>DFTRDBCOL</td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNDFTCOL</td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPKG</td>
<td>Package qualified object name</td>
<td></td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Package</td>
<td>Name, *OBJ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *OBJLIB</td>
<td></td>
</tr>
<tr>
<td>SQLPATH</td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Other values (up to 268 repetitions): Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQLCURRULE</td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td>SAAFLAG</td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td>FLAGSTD</td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td>PRTFILE</td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Print file</td>
<td>Name, QSYSPRT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>DBGVIEW</td>
<td>Debugging view</td>
<td>*NONE, *SOURCE</td>
<td>Optional</td>
</tr>
<tr>
<td>USRPRF</td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNUSRPRF</td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Other values: Qualified object name</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Sort sequence</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>LANGID</td>
<td>Language id</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>TOSRCFILE</td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: To source file</td>
<td>Name, *CALC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *QTEMP, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>DECRESULT</td>
<td>Decimal result options</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Element 1: Maximum precision</td>
<td>31, 63</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 2: Maximum scale</td>
<td>0-63, 31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 3: Minimum divide scale</td>
<td>0-9, 0</td>
<td></td>
</tr>
<tr>
<td>COMPILEOPT</td>
<td>Compiler options</td>
<td>Character value, *NONE</td>
<td>Optional</td>
</tr>
</tbody>
</table>
**Object (OBJ)**

Specifies the object to be created.

This is a required parameter.

**Qualifier 1: Object**

`name` Specify the name of the object to be created.

**Qualifier 2: Library**

*CURLIB*

The new object is created in the current library for the job. If no library is specified as the current library for the job, the QGPL library is used.

`name` Specify the name of the library where the object is created.

---

**Source file (SRCFILE)**

Specifies the source file that contains the C++ source statements and SQL statements.

**Qualifier 1: Source file**

*QCSRC*

Source file QCSRC contains the C++ source.

`name` Specify the name of the source file that contains the C++ source.

**Qualifier 2: Library**

*Ltbl* All libraries in the job's library list are searched until the first match is found.

*CURLIB*

The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

`name` Specify the name of the library to be searched.

---

**Source member (SRCMBR)**

Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the **Source file (SRCFILE)** parameter is a database file.

*OBJ*

The source file member that has the same name as the value specified for the **Object (OBJ)** parameter contains the input source.

`name` Specify the name of the source file member that contains the input source.
Commitment control (COMMIT)

Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or *RS

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC

Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

Relational database (RDB)

Specifies the name of the relational database where the SQL package is to be created.

*LOCAL

The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE

An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

ame

Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

Listing output (OUTPUT)

Specifies whether the precompiler listing is generated.
*NONE
   The precompiler listing is not generated.
*PRINT
   The precompiler listing is generated.

Text ’description’ (TEXT)
Specifies text that briefly describes the program and its function.
*SRCMBRTXT
   The text is taken from the source file member being used to create the program. If the source file
   is an inline file or a device file, the text is blank.
*BLANK
   No text is specified.
’description’
   Specify no more than 50 characters, enclosed in apostrophes.

RDB user (USER)
Specifies the user name sent to the remote system when starting the conversation. This parameter is valid
only when RDB is specified.
*CURRENT
   The user name associated with the current job is used.
   name  Specify the user name to be used for the application server job.

RDB user password (PASSWORD)
Specifies the password to be used on the remote system. This parameter is valid only when RDB is
specified.
*NONE
   No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this
   value is specified.
   Note: Specifying a password of a blank is the same as specifying *NONE.
   password
   Specify the password of the user name specified for the USER parameter.

Precompiler options (OPTION)
Specifies whether one or more of the following options are used when the C++ source is precompiled. If
an option is specified more than once, or if two options conflict, the last option specified is used.

Cross reference options:
**XREF** The precompiler cross-references items in the program to the statement numbers in the program that refer to those items.

**NOXREF** The precompiler does not cross-reference names.

**Program creation** options:

**GEN** The precompiler creates the module object.

**NOGEN** The precompiler does not call the C++ compiler. No module is created.

**Decimal point** options:

**JOB** The representation for the decimal point specified for the job at precompile time is used.

**Note:** If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4) is equivalent to VALUES(1.1,2,23,4) where the decimal point is the period.

**SYSVAL** The value used as the decimal point in numeric constants is from the QDECFMT system value. This value is also used as the decimal point character when casting a numeric value to character.

**Note:** If QDECFMT specifies that the value used as the decimal point is a comma; any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4) is equivalent to VALUES(1.1,2,23,4) where the decimal point is the period.

**PERIOD** The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

**COMMA** The value used as the decimal point in numeric constants is a comma. Any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4) is equivalent to VALUES(1.1,2,23,4) where the decimal point is the period.

**Naming convention** options:

**SYS** Specifies that the system naming convention is used (library-name/file-name).

**SQL** Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the **Relational database (RDB)** parameter, and the database is on a system that is not an iSeries system, **SQL** must be specified as the naming convention.

**Second-level message text** options:

**NOSECLVL** Second-level text descriptions are not added to the listing.

**SECLVL** Second-level text with replacement data is added for all messages on the listing.

**NUL required** options:
*NOCNULRQD

For output character and graphic host variables, the NUL-terminator is not returned when the host variable is exactly the same length as the data. Input character and graphic host variables do not require a NUL-terminator.

*CNULRQD

Output character and graphic host variables always contain the NUL-terminator. If there is not enough space for the NUL-terminator, the data is truncated and the NUL-terminator is added. Input character and graphic host variables require a NUL-terminator.

**LOB optimization for DRDA options:**

*OPTLOB

The first FETCH for a cursor determines how the cursor will be used for LOBs (Large Objects) on all subsequent FETCHes. This option remains in effect until the cursor is closed.

If the first FETCH uses a LOB locator to access a LOB column, no subsequent FETCH for that cursor can fetch that LOB column into a LOB host variable.

If the first FETCH places the LOB column into a LOB host variable, no subsequent FETCH for that cursor can use a LOB locator for that column.

*NOOPTLOB

There is no restriction on whether a column is retrieved into a LOB locator or into a LOB host variable. This option can cause performance to degrade.

**Event file creation options:**

*NOEVENTF

The compiler will not produce an event file for use by CoOperative Development Environment (CODE).

*EVENTF

The compiler produces an event file for use by CoOperative Development Environment (CODE). The event file will be created as a member in the file EVFEVENT in your object library. CODE uses this file to offer error feedback integrated with the CODE editor. This option is normally specified by CODE on your behalf.

**Target release (TGTRLS)**

Specifies the release of the operating system on which you intend to use the object being created.

When specifying the **target-release** value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT

The object is to be used on the release of the operating system currently running on your system. The object can also be used on a system with any subsequent release of the operating system installed.

*PRV

The object is to be used on the previous release with modification level 0 of the operating system. The object can also be used on a system with any subsequent release of the operating system installed.
target-release
Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

INCLUDE file (INCFILE)
Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

Single values
*SRCFILE
The qualified source file you specify for the Source file (SRCFILE) parameter contains the source file members specified on any SQL INCLUDE statements.

Qualifier 1: INCLUDE file
name
Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the Source file (SRCFILE) parameter.

Qualifier 2: Library
*LIBL
All libraries in the job’s library list are searched until the first match is found.

*CURLIB
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name
Specify the name of the library where the source file is located.

Allow copy of data (ALWCPYDTA)
Specifies whether a copy of the data can be used in a SELECT statement.

*OPTIMIZE
The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

*YES
A copy of the data is used only when necessary.

*NO
A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQLCSR)
Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released. SQL cursors are explicitly closed when the user issues the CLOSE, COMMIT, or ROLLBACK (without HOLD) SQL statements.
*ENDACTGRP

SQL cursors are closed and SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released when the activation group ends.

*ENDMOD

SQL cursors are closed and SQL prepared statements are implicitly discarded when the module is exited. LOCK TABLE locks are released when the first SQL program on the call stack ends.

Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.

*ALLREAD

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying *ALLREAD:

• Allows record blocking for all read-only cursors.
• Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  – The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
  – Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

*NONE

Rows are not blocked for retrieval of data for cursors.

Specifying *NONE:

• Guarantees that the data retrieved is current.
• May reduce the amount of time required to retrieve the first row of data for a query.
• Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
• Can degrade the overall performance of a query that retrieves a large number of rows.

*READ

Records are blocked for read-only retrieval of data for cursors when:

• *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
• The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

Delay PREPARE (DLYPRP)

Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.
*NO Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

*YES Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

Note: If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.

Severity level (GENLVL)

Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.

If the Relational database (RDB) parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.

10 Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated.

0-40 Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called.

Source margins (MARGINS)

Specifies the part of the precompiler input record that contains source text.

Element 1: Left margin

*SRCPFIL The left margin will be set to 1 and the right margin will be set to the record length of the input source file.

1-32754 Specify the beginning position to be used for each input record.

Element 2: Right margin

1-32754 Specify the ending position to be used for each input record.
**Date format (DATFMT)**

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

**Note:** An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA The United States date format mm/dd/yyyy is used.

*ISO The International Organization for Standardization (ISO) date format yyyy-mm-dd is used.

*EUR The European date format dd.mm.yyyy is used.

*JIS The Japanese Industrial Standard date format yyyy-mm-dd is used.

*MDY The date format mm/dd/yy is used.

*DMY The date format dd/mm/yy is used.

*YMD The date format yy/mm/dd is used.

*JUL The Julian date format yy/ddd is used.

**Date separator character (DATSEP)**

Specifies the separator to be used when accessing date result columns.

**Note:** This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the Date format (DATFMT) parameter.

*JOB The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

'/' A slash is used as the date separator.

'.' A period is used as the date separator.

'-' A dash is used as the date separator.

',' A comma is used as the date separator.

'' or *BLANK A blank is used as the date separator.
**Time format (TIMFMT)**

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

- **HMS** The hh:mm:ss format is used.
- **USA** The United States time format hh:mmxx is used, where xx is AM or PM.
- **ISO** The International Organization for Standardization (ISO) time format hh.mm.ss is used.
- **EUR** The European time format hh.mm.ss is used.
- **JIS** The Japanese Industrial Standard time format hh:mm:ss is used.

**Time separator character (TIMSEP)**

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

- **JOB** The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.
  
  Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

- : A colon is used as the time separator.
- . A period is used as the time separator.
- , A comma is used as the time separator.
- ‘ ’ or *BLANK A blank is used as the time separator.

**Replace (REPLACE)**

Specifies if a SQL module is created when there is an existing SQL module of the same name in the same library. The value for this parameter is passed to the CRTCPPMOD command.

- **YES** A new SQL module is created, and any existing module of the same name in the specified library is moved to QRPLOBJ.
- **NO** A new SQL module is not created if a module of the same name already exists in the specified library.
**RDB connect method (RDBCNNMTH)**

Specifies the semantics used for CONNECT statements.

*DUW*

CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW*

CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

**Default collection (DFTRDBCOL)**

Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE*

The naming convention specified for the Precompiler options (OPTION) parameter is used.

name  
Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

**Dynamic default collection (DYNDFTCOL)**

Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.

*NO*  
Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.

*YES*  
The schema name specified for the DFTRDBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.

**Package (SQLPKG)**

Specifies the qualified name of the SQL package created on the relational database specified for the RDB parameter of this command.

Qualifier 1: Package

*OBJ*  
The name of the SQL package is the same as the object name specified for the OBJ parameter.

name  
Specify the name of the SQL package. If the remote system is not an iSeries system, no more than 8 characters can be specified.

Qualifier 2: Library
**OBJLIB**

The package is created in the library with the same name as the library specified for the OBJ parameter.

*name* Specify the name of the library where the package is created.

---

**SQL path (SQLPATH)**

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

**NAMING**

The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is "*LIBL", the current library list at runtime.

For "SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

*LIBL* The path used is the library list at runtime.

*name* Specify one or more schema names. A maximum of 268 schema names may be specified.

---

**SQL rules (SQLCURRULE)**

Specifies the semantics used for SQL statements.

**DB2** The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

Hexadecimal constants are treated as character data.

**STD** The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:

Hexadecimal constants are treated as binary data.

---

**IBM SQL flagging (SAAFLAG)**

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

**NOFLAG** No checks are made to see whether SQL statements conform to IBM SQL syntax.

**FLAG** Checks are made to see whether SQL statements conform to IBM SQL syntax.
ANS flagging (FLAGSTD)

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE
   No checks are made to see whether SQL statements conform to ANSI standards.

*ANS
   Checks are made to see whether SQL statements conform to standards.

Print file (PRTFILE)

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

QSYPRT
   The precompiler output file is directed to the IBM-supplied printer file, QSYPRT. The file QSYPRT has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

name
   Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIBL
   All libraries in the job’s library list are searched until the first match is found.

*CURLIB
   The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name
   Specify the name of the library where the printer file is located.

Debugging view (DBGVIEW)

Specifies the type of source debug information to be provided by the SQL precompiler.

*NONE
   The source view will not be generated.

*SOURCE
   The SQL precompiler will provide the source views for the root and if necessary, SQL INCLUDE statements. A view is to be provided which contains the statements generated by the precompiler.

User profile (USRPRF)

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

*NAMING
   The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.
*USER
The profile of the user running the program or SQL package is used.

*OWNER
The user profiles of both the owner and the user are used when the program or SQL package is run.

Dynamic user profile (DYNUSRPRF)
Specifies the user profile used for dynamic SQL statements.

*USER
Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

*OWNER
Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

Sort sequence (SRTSEQ)
Specifies the sort sequence table to be used for string comparisons in SQL statements.

Note: *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

Single values

*JOB         The SRTSEQ value for the job is used.
*JOBRUN      The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.
*LANGIDUNQ   The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.
*LANGIDSHR   The shared-weight sort table for the language specified for the LANGID parameter is used.
*HEX          A sort sequence table is not used. The hexadecimal values of the characters are used to determine the sort sequence.

Qualifier 1: Sort sequence
name         Specify the name of the sort sequence table to be used with this program.

Qualifier 2: Library

*LIBL        All libraries in the job’s library list are searched until the first match is found.
*CURLIB      The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.
name         Specify the name of the library to be searched.
Language id (LANGID)

Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.

*JOB  The LANGID value for the job is retrieved during the precompile.

*JOBRUN  The LANGID value for the job is retrieved when the program is run. For distributed applications, LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.

language-id
    Specify the language identifier to be used by the program.

To source file (TOSRCFILE)

Specifies the source file that is to contain the output source member that has been processed by the SQL precompiler. If the specified source file is not found, it will be created. The output member will have the same name as the name specified for the SRCMBR parameter.

Qualifier 1: To source file

*CALC  The output source file name will be generated based on the margins of the source file. The name will be QSQLTxxxxx, where xxxx is the width of the source file. If the source file record length is less than or equal to 92, the name will be QSQLTEMP.

name  Specify the name of the source file to contain the output source member.

Qualifier 2: Library

QTEMP  The library QTEMP will be used.

*LIBL  The job's library list is searched for the specified file. If the file is not found in any library in the library list, the file will be created in the current library.

*CURLIB  The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.

name  Specify the name of the library that is to contain the output source file.

Decimal result options (DECRESULT)

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

Element 1: Maximum precision

31  The maximum precision (length) that should be returned for the result data types is 31 digits.
The maximum precision (length) that should be returned for the result data types is 63 digits.

**Element 2: Maximum scale**

- The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.

- Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.

**Element 3: Minimum divide scale**

- The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.

- Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.

---

**Compiler options (COMPILEOPT)**

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. If `INCDIR` is anywhere in the string, the precompiler will call the compiler using the SRCSTMF parameter. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

- *NONE*  
  No additional parameters will be used on the compiler command.

- character-value  
  Specify no more than 5000 characters, enclosed in apostrophes.

---

**Examples**

```sql
CRTSQLCPPI OBJ(PAYROLL) OBJTYPE(*MODULE) TEXT('Payroll Program')
```

This command runs the SQL precompiler which precompiles the C++ source and stores the changed source in member PAYROLL of source file QSQLTEMP in library QTEMP. The command calls the ILE C++ compiler to create module PAYROLL in the current library by using the source member that is created by the SQL precompiler.

---

**Error messages**

*ESCAPE Messages*
SQL9001
SQL precompile failed.

SQL9002
Conflict in TGTRLS parameters for SQL precompile and &7 compile.

SQL9003
&7 Compile at wrong level for SQL source.

SQL9006
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Create SQL FORTRAN Program (CRTSQLFTN)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Create SQL FORTRAN Program (CRTSQLFTN) command calls the Structured Query Language (SQL) precompiler which precompiles FORTRAN source containing SQL statements and produces a temporary source member.

Note: An IBM FORTRAN compiler is no longer supported. This CRTSQLFTN command is provided for use by other non-IBM FORTRAN compilers.

If the Relational database (RDB) parameter is specified and a program is created, an SQL package will be created at the specified relational database.

Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGM</td>
<td>Program</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Program</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Source file</td>
<td>Name, *QFTNSRC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *PGM</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text 'description'</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, X'40'</td>
<td>Optional</td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLSOSQCLS</td>
<td>Close SQL cursor</td>
<td>*ENDPGM, *ENDSQL, *ENDJOB</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>Keyword</td>
<td>Description</td>
<td>Choices</td>
<td>Notes</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, /, ., ,, X'40', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, ., ,, X'40', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Replace</td>
<td>*YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>RDBCNNMTH</td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td>DFTDRCOL</td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNDFTCOL</td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPKG</td>
<td>Package</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPATH</td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLCURRUSE</td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td>SAAFLAG</td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td>FLAGSTD</td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td>PRFFILE</td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>USRPRF</td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNUSRPRF</td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>LANGID</td>
<td>Language id</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>TOSRCFILE</td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>DECRESULT</td>
<td>Decimal result options</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td>COMPILEOPT</td>
<td>Compiler options</td>
<td>Character value, *NONE</td>
<td>Optional</td>
</tr>
</tbody>
</table>

**Program (PGM)**

Specifies the program to be created.

This is a required parameter.

**Qualifier 1: Program**

*name* Specify the name of the program to be created.
Qualifier 2: Library

*CURLIB
The current library for the job is used to locate the compiled program. If no current library entry exists in the library list, QGPL is used.

name Specify the name of the library where the compiled program is located.

Source file (SRCFILE)

Specifies the source file that contains the FORTRAN source statements and SQL statements.

Qualifier 1: Source file

QFTNSRC
Source file QFTNSRC contains the FORTRAN source.

name Specify the name of the source file that contains the FORTRAN source.

Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.

*CURLIB
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library to be searched.

Source member (SRCMBR)

Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the Source file (SRCFILE) parameter is a database file.

*PGM The source file member that has the same name as the program name specified for the Program (PGM) parameter contains the input source.

name Specify the name of the source file member that contains the input source.

Commitment control (COMMIT)

Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are
locked until the end of the unit of work (transaction). A row that is selected, but not updated, is
locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or **RS
   Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT,
   LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and
   inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other
   jobs cannot be seen.

*NONE or **NC
   Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If
   the SQL DROP SCHEMA statement is included in the program, **NONE or **NC must be used. If
   a relational database is specified for the Relational database (RDB) parameter, and the relational
   database is on a system that is not on an iSeries system, **NONE or **NC cannot be specified.

*RR
   Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT,
   LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and
   inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other
   jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements
   are locked exclusively until the end of the unit of work (transaction).

Relational database (RDB)

Specifies the name of the relational database where the SQL package is to be created.

*LOCAL
   The program is created as a distributed SQL program. The SQL statements will access the local
database. An SQL package object is not created as part of the precompile process. The Create
Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE
   An SQL package object is not created. The program object is not a distributed program and the
   Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name
   Specify the name of the relational database where the new SQL package object is to be created.
   When the name of the local relational database is specified, the program created is still a
distributed SQL program. The SQL statements will access the local database.

Text 'description' (TEXT)

Specifies text that briefly describes the program and its function.

*SRCMBRTXT
   The text is taken from the source file member being used to create the program. If the source file
   is an inline file or a device file, the text is blank.

*BLANK
   No text is specified.

'description'
   Specify no more than 50 characters, enclosed in apostrophes.
RDB user (USER)

Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

*CURRENT
   The user name associated with the current job is used.

name
   Specify the user name to be used for the application server job.

RDB user password (PASSWORD)

Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.

*NONE
   No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this value is specified.

   Note: Specifying a password of a blank is the same as specifying *NONE.

password
   Specify the password of the user name specified for the USER parameter.

Precompiler options (OPTION)

Specifies whether the following options are used when the FORTRAN source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

Source listing options:

*NOSRC or *NOSOURCE
   The precompiler does not produce a source printout unless errors are detected during precompile or create package.

*SRC or *SOURCE
   The precompiler produces a source printout.

Cross reference options:

*NOXREF
   The precompiler does not produce a cross-reference of names.

*XREF
   The precompiler produces a cross-reference between items declared in your program and the numbers of the statements in your program that refer to these items.

Host language compiler call options:

*NOSRC
   The precompiler does not call the FORTRAN compiler. Neither a program nor an SQL package is created.

Decimal point options:
**PERIOD**

The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

**JOB**

The representation for the decimal point specified for the job at precompile time is used.

Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) in which the decimal point is a period.

**SYSVAL**

The value used as the decimal point is the QDECFMT system value.

Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) in which the decimal point is a period.

**COMMA**

The value used as the decimal point is a comma.

Note: Any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is a period.

**Naming convention options:**

**SYS**

Specifies that the system naming convention is used (library-name/file-name).

**SQL**

Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the Relational database (RDB) parameter, and the database is on a system that is not an iSeries system, *SQL must be specified as the naming convention.

**Second-level message text options:**

**NOSECLVL**

Second-level text descriptions are not added to the listing.

**SECLVL**

Second-level text with replacement data is added for all messages on the listing.

**Debug information options:**

**NODEBUG**

Symbolic extended program model (EPM) debug information is not stored with the program. This option is passed to the compiler and does not affect the SQL precompiler.

**DEBUG**

Symbolic EPM debug information is stored with the program. This option is passed to the compiler and does not affect the SQL precompiler.

**Target release (TGTRLS)**

Specifies the release of the operating system on which you intend to use the object being created.
When specifying the target-release value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT
The object is to be used on the release of the operating system currently running on your system. The object can also be used on a system with any subsequent release of the operating system installed.

*PRV
The object is to be used on the previous release with modification level 0 of the operating system. The object can also be used on a system with any subsequent release of the operating system installed.

target-release
Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

INCLUDE file (INCFILE)
Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

Single values

*SRCFILE
The qualified source file you specify for the Source file (SRCFILE) parameter contains the source file members specified on any SQL INCLUDE statements.

Qualifier 1: INCLUDE file
name
Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the Source file (SRCFILE) parameter.

Qualifier 2: Library
*LILB
All libraries in the job’s library list are searched until the first match is found.

*CURLIB
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name
Specify the name of the library where the source file is located.

Allow copy of data (ALWCPYDTA)
Specifies whether a copy of the data can be used in a SELECT statement.
*OPTIMIZE

The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

*YES A copy of the data is used only when necessary.

*NO A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQCSR)

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks released. SQL cursors are explicitly closed by issuing the CLOSE, COMMIT (without HOLD), ROLLBACK (without HOLD), or CONNECT (Type 1) SQL statements.

*ENDPGM

The SQL cursors are closed and SQL prepared statements are discarded when the program ends. LOCK TABLE locks are released when the first SQL program on the call stack ends.

*ENSQL

The SQL cursors remain open between calls and rows can be fetched without running another SQL OPEN statement. One of the programs higher on the call stack must have run at least one SQL statement. The SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the first SQL program on the call stack ends. If you specify *ENSQL for a program that is the first SQL program called (the first SQL program on the call stack), the program is treated as if *ENDPGM was specified.

*ENDJOB

SQL cursors remain open between calls and can be fetched without running another SQL OPEN statement. The programs higher on the call stack do not need to have run SQL statements. SQL cursors are left open, SQL prepared statements are preserved, and LOCK TABLE locks are held when the first SQL program on the call stack ends. SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the job ends.

Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.

*ALLREAD

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying *ALLREAD:

• Allows record blocking for all read-only cursors.
• Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  – The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

**NONE**

Rows are not blocked for retrieval of data for cursors.

Specifying *NONE:

- Guarantees that the data retrieved is current.
- May reduce the amount of time required to retrieve the first row of data for a query.
- Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
- Can degrade the overall performance of a query that retrieves a large number of rows.

**READ**

Records are blocked for read-only retrieval of data for cursors when:

- *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
- The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

---

**Delay PREPARE (DLYPRP)**

Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

**NO**

Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

**YES**

Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

**Note:** If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.

---

**Severity level (GENLVL)**

Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.

If the Relational database (RDB) parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.
Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated.

Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called.

**Date format (DATFMT)**

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

**Note:** An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA The United States date format `mm/dd/yyyy` is used.

*ISO The International Organization for Standardization (ISO) date format `yyyy-mm-dd` is used.

*EUR The European date format `dd.mm.yyyy` is used.

*JIS The Japanese Industrial Standard date format `yyyy-mm-dd` is used.

*MDY The date format `mm/dd/yy` is used.

*DMY The date format `dd/mm/yy` is used.

*YMD The date format `yy/mm/dd` is used.

*JUL The Julian date format `yy/ddd` is used.

**Date separator character (DATSEP)**

Specifies the separator to be used when accessing date result columns.

**Note:** This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the Date format (DATFMT) parameter.

*JOB The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

'/' A slash is used as the date separator.

'.' A period is used as the date separator.

'-' A dash is used as the date separator.

',' A comma is used as the date separator.
A blank is used as the date separator.

**Time format (TIMFMT)**

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS  The hh:mm:ss format is used.

*USA  The United States time format hh:mmxx is used, where xx is AM or PM.

*ISO  The International Organization for Standardization (ISO) time format hh.mm.ss is used.

*EUR  The European time format hh.mm.ss is used.

*JIS  The Japanese Industrial Standard time format hh:mm:ss is used.

**Time separator character (TIMSEP)**

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

*JOB  The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

‘:’  A colon is used as the time separator.

‘.’  A period is used as the time separator.

‘,’  A comma is used as the time separator.

‘ ’ or *BLANK  A blank is used as the time separator.

**Replace (REPLACE)**

Specifies whether a SQL program or SQL package is created when there is an existing SQL program or SQL package of the same name in the same library. The value is passed to the CRTxxxPGM command (where xxx is the language of the program being created) and the Create SQL Package (CRTSQLPKG) command if the RDB parameter is specified.
*YES  An SQL program or SQL package is created and any existing SQL program or SQL package of the same name in the specified library is moved to QRPLOBJ. The authorities for the existing SQL package are kept for the new SQL package.

*NO    An SQL program or package is not created if an SQL program or package of the same name already exists in the specified library.

RDB connect method (RDBCNNMTH)

Specifies the semantics used for CONNECT statements.

*DUW CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

Default collection (DFTRBCOL)

Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE The naming convention specified for the Precompiler options (OPTION) parameter is used.

name Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

Dynamic default collection (DYNDFTCOL)

Specifies whether the default schema name specified for the DFTRBCOL parameter is also used for dynamic statements.

*NO    Do not use the value specified for the DFTRBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.

*YES    The schema name specified for the DFTRBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.
Package (SQLPKG)

Specifies the name and library of the SQL package to be created on the remote relational database specified for the **Relational database (RDB)** parameter of this command.

**Qualifier 1: Package**

*PGM  The name of the SQL package is the same as the program name.

name  Specify the name of the SQL package. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

**Qualifier 2: Library**

*PGMLIB  The SQL package is placed in the schema that has the same name as the library containing the program.

name  Specify the name of the schema where the SQL package is to be placed. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

SQL path (SQLPATH)

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

**NAMING**

The path used depends on the naming convention specified for the **Precompiler options** (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For *SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

*LIBL  The path used is the library list at runtime.

name  Specify one or more schema names. A maximum of 268 schema names may be specified.

SQL rules (SQLCURRULE)

Specifies the semantics used for SQL statements.

*DB2  The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

Hexadecimal constants are treated as character data.

*STD  The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:

Hexadecimal constants are treated as binary data.
IBM SQL flagging (SAAFLAG)

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG
   No checks are made to see whether SQL statements conform to IBM SQL syntax.

*FLAG
   Checks are made to see whether SQL statements conform to IBM SQL syntax.

ANS flagging (FLAGSTD)

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE
   No checks are made to see whether SQL statements conform to ANSI standards.

*ANS
   Checks are made to see whether SQL statements conform to standards.

Print file (PRTFILE)

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

QSYSPR
   The precompiler output file is directed to the IBM-supplied printer file, QSYSPRT. The file QSYSPR has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

name
   Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIB
   All libraries in the job’s library list are searched until the first match is found.

*CURLIB
   The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name
   Specify the name of the library where the printer file is located.

User profile (USRPRF)

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

*NAMING
   The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.
The profile of the user running the program or SQL package is used.

The user profiles of both the owner and the user are used when the program or SQL package is run.

**Dynamic user profile (DYNUSRPRF)**

Specifies the user profile used for dynamic SQL statements.

**USER**
Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

**OWNER**
Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

**Sort sequence (SRTSEQ)**

Specifies the sort sequence table to be used for string comparisons in SQL statements.

**Note:** *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

**Single values**

**JOB**  The SRTSEQ value for the job is used.

**JOBRUN**  The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.

**LANGIDUNQ**  The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.

**LANGIDSHR**  The shared-weight sort table for the language specified for the LANGID parameter is used.

**HEX**  A sort sequence table is not used. The hexadecimal values of the characters are used to determine the sort sequence.

**Qualifier 1: Sort sequence**

**name**  Specify the name of the sort sequence table to be used with this program.

**Qualifier 2: Library**

**LIBL**  All libraries in the job’s library list are searched until the first match is found.

**CURLIB**  The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

**name**  Specify the name of the library to be searched.
**Language id (LANGID)**

Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.

*JOB The LANGID value for the job is retrieved during the precompile.

*JOBRUN

The LANGID value for the job is retrieved when the program is run. For distributed applications, LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.

**language-id**

Specify the language identifier to be used by the program.

---

**To source file (TOSRCFILE)**

Specifies the source file that is to contain the output source member that has been processed by the SQL precompiler. If the specified source file is not found, it will be created. The output member will have the same name as the name specified for the SRCMBR parameter.

**Qualifier 1: To source file**

**TOSRCFILE**

The source file TOSRCFILE will be used.

**name**

Specify the name of the source file to contain the output source member.

**Qualifier 2: Library**

**TOSRCFILE**

The library TOSRCFILE will be used.

**name**

Specify the name of the library that is to contain the output source file.

---

**Decimal result options (DECRESULT)**

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

**Element 1: Maximum precision**

| 31 | The maximum precision (length) that should be returned for the result data types is 31 digits. |
| 63 | The maximum precision (length) that should be returned for the result data types is 63 digits. |
Element 2: Maximum scale

31  The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.

0-63 Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.

Element 3: Minimum divide scale

0  The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.

0-9 Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.

Compiler options (COMPILEOPT)

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

*NONE  No additional parameters will be used on the compiler command.

character-value  Specify no more than 5000 characters, enclosed in apostrophes.

Examples

CRTSQLFTN  PGM(PAYROLL)  TEXT('Payroll Program')

This command runs the SQL precompiler, which precompiles the FORTRAN source and stores the changed source in member PAYROLL of source file QSQLTEMP in library QTEMP.

Error messages

*ESCAPE Messages

SQL9001  SQL precompile failed.

SQL9002  Conflict in TGTRLS parameters for SQL precompile and &7 compile.

SQL9003  &7 Compile at wrong level for SQL source.
SQL9004
Create of SQL package failed.

SQL9006
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Create SQL PL/I Program (CRTSQLPLI)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Create SQL PL/I Program (CRTSQLPLI) command calls the Structured Query Language (SQL) precompiler which precompiles PL/I source containing SQL statements, produces a temporary source member, and then optionally calls the PL/I compiler to compile the program.

If the Relational database (RDB) parameter is specified and a program is created, an SQL package will be created at the specified relational database.

### Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGM</td>
<td>Program</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Program</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Source file</td>
<td>Name, QPLISRC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *PGM</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text ‘description’</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, ’ ’</td>
<td>Optional</td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSQLCR</td>
<td>Close SQL cursor</td>
<td>*ENDPGM, *ENDSQL, *ENDJOB</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPREP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>MARGINS</td>
<td>Source margins</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Element 1: Left margin</td>
<td>1-80, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 2: Right margin</td>
<td>1-80</td>
<td></td>
</tr>
</tbody>
</table>

© Copyright IBM Corp. 1998, 2006
<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, ';', ',', '.', ':', ' ', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, ';', ',', '.', ':', ' ', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Replace</td>
<td>*YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>RDBCNNMTH</td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td>DFTRDBCOL</td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNDFTCOL</td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPKG</td>
<td>Package</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPATH</td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLCURRULE</td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td>SAAFLAG</td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td>FLAGSTD</td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td>PRTFILE</td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>USRPRF</td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNUSRPRF</td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>LANGID</td>
<td>Language id</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>TOSRCFILE</td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>DECRESCUTION</td>
<td>Decimal result options</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td>COMPILEOPT</td>
<td>Compiler options</td>
<td>Character value, *NONE</td>
<td>Optional</td>
</tr>
</tbody>
</table>

**Program (PGM)**

Specifies the program to be created.

This is a required parameter.

**Qualifier 1: Program**

*name* Specify the name of the program to be created.
Qualifier 2: Library

*CURLIB
   The current library for the job is used to locate the compiled program. If no current library entry exists in the library list, QGPL is used.

name  Specify the name of the library where the compiled program is located.

Source file (SRCFILE)

Specifies the source file that contains the PL/I source statements and SQL statements.

Qualifier 1: Source file

QPLISRC
   Source file QPLISRC contains the PL/I source.

name  Specify the name of the source file that contains the PL/I source.

Qualifier 2: Library

*LIBL  All libraries in the job’s library list are searched until the first match is found.

*CURLIB
   The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name  Specify the name of the library to be searched.

Source member (SRCMBR)

Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the Source file (SRCFILE) parameter is a database file.

*PGM  The source file member that has the same name as the program name specified for the Program (PGM) parameter contains the input source.

name  Specify the name of the source file member that contains the input source.

Commitment control (COMMIT)

Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR
   Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS  Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are
locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or *RS  
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC  
Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR  
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

Relational database (RDB)

Specifies the name of the relational database where the SQL package is to be created.

*LOCAL  
The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE  
An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name  
Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

Text ‘description’ (TEXT)

Specifies text that briefly describes the program and its function.

*SRCMBRTXT  
The text is taken from the source file member being used to create the program. If the source file is an inline file or a device file, the text is blank.

*BLANK  
No text is specified.

description  
Specify no more than 50 characters, enclosed in apostrophes.
RDB user (USER)
Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

*CURRENT
The user name associated with the current job is used.

name Specify the user name to be used for the application server job.

RDB user password (PASSWORD)
Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.

*NONE
No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this value is specified.

Note: Specifying a password of a blank is the same as specifying *NONE.

password Specify the password of the user name specified for the USER parameter.

Precompiler options (OPTION)
Specifies whether the following options are used when the PL/I source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

Source listing options:

*NOSRC or *NOSOURCE
The precompiler does not produce a source printout unless errors are detected during precompile or create package.

*SRC or *SOURCE
The precompiler produces a source printout.

Cross reference options:

*NOXREF
The precompiler does not produce a cross-reference of names.

*XREF
The precompiler produces a cross-reference between items declared in your program and the numbers of the statements in your program that refer to these items.

Host language compiler call options:

*GEN
The precompiler calls the PL/I compiler. If a relational database name is specified for the Relational database (RDB) parameter, and the compile is successful, an SQL package is also created.

*Nogen
The precompiler does not call the PL/I compiler. Neither a program nor an SQL package is created.
Decimal point options:

*PERIOD
The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

*JOB
The representation for the decimal point specified for the job at precompile time is used.
Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) in which the decimal point is a period.

*SYSVAL
The value used as the decimal point is the QDECFMT system value.
Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) in which the decimal point is a period.

*COMMA
The value used as the decimal point is a comma.
Note: Any numeric constants in lists (such as in the SELECT clause or the VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is a period.

Naming convention options:

*SYS
Specifies that the system naming convention is used (library-name/file-name).

*SQL
Specifies that the SQL naming convention is used (schema-name.table-name).
If a relational database is specified for the Relational database (RDB) parameter, and the database is on a system that is not an iSeries system, *SQL must be specified as the naming convention.

Second-level message text options:

*NOSECLVL
Second-level text descriptions are not added to the listing.

*SECLVL
Second-level text with replacement data is added for all messages on the listing.

LOB optimization for DRDA options:

*OPTLOB
The first FETCH for a cursor determines how the cursor will be used for LOBs (Large Objects) on all subsequent FETCHes. This option remains in effect until the cursor is closed.
If the first FETCH uses a LOB locator to access a LOB column, no subsequent FETCH for that cursor can fetch that LOB column into a LOB host variable.
If the first FETCH places the LOB column into a LOB host variable, no subsequent FETCH for that cursor can use a LOB locator for that column.

*NOOPTLOB
There is no restriction on whether a column is retrieved into a LOB locator or into a LOB host variable. This option can cause performance to degrade.
Target release (TGTRLS)

Specifies the release of the operating system on which you intend to use the object being created.

When specifying the target-release value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT
The object is to be used on the release of the operating system currently running on your system.
The object can also be used on a system with any subsequent release of the operating system installed.

*PRV
The object is to be used on the previous release with modification level 0 of the operating system.
The object can also be used on a system with any subsequent release of the operating system installed.

target-release
Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

INCLUDE file (INCFILE)

Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

Single values

*SRCFILE
The qualified source file you specify for the Source file (SRCFILE) parameter contains the source file members specified on any SQL INCLUDE statements.

Qualifier 1: INCLUDE file

name
Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the Source file (SRCFILE) parameter.

Qualifier 2: Library

*LIBL
All libraries in the job’s library list are searched until the first match is found.

*CURLIB
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name
Specify the name of the library where the source file is located.
Allow copy of data (ALWCPYDTA)

Specifies whether a copy of the data can be used in a SELECT statement.

*OPTIMIZE

The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

*YES A copy of the data is used only when necessary.

*NO A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQLCRS)

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks released. SQL cursors are explicitly closed by issuing the CLOSE, COMMIT (without HOLD), ROLLBACK (without HOLD), or CONNECT (Type 1) SQL statements.

*ENDPGM

The SQL cursors are closed and SQL prepared statements are discarded when the program ends. LOCK TABLE locks are released when the first SQL program on the call stack ends.

*ENDSQL

The SQL cursors remain open between calls and rows can be fetched without running another SQL OPEN statement. One of the programs higher on the call stack must have run at least one SQL statement. The SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the first SQL program on the call stack ends. If you specify *ENDSQL for a program that is the first SQL program called (the first SQL program on the call stack), the program is treated as if *ENDPGM was specified.

*ENDJOB

SQL cursors remain open between calls and can be fetched without running another SQL OPEN statement. The programs higher on the call stack do not need to have run SQL statements. SQL cursors are left open, SQL prepared statements are preserved, and LOCK TABLE locks are held when the first SQL program on the call stack ends. SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the job ends.

Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.

*ALLREAD

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying *ALLREAD:

- Allows record blocking for all read-only cursors.
- Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
– The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
– Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

*NONE
Rows are not blocked for retrieval of data for cursors.

Specifying *NONE:
• Guarantees that the data retrieved is current.
• May reduce the amount of time required to retrieve the first row of data for a query.
• Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
• Can degrade the overall performance of a query that retrieves a large number of rows.

*READ
Records are blocked for read-only retrieval of data for cursors when:
• *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
• The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

---

### Delay PREPARE (DLYPRP)

Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

*NO
Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

*YES
Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

Note: If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.

---

### Severity level (GENLVL)

Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.
If the **Relational database (RDB)** parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.

| 10 | Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated. |
| 0-40 | Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called. |

**Source margins (MARGINS)**

Specifies the part of the precompiler input record that contains source text.

**Element 1: Left margin**

*SRCFILE

The margin values of the file member you specify for the **Source member (SRCMBR)** parameter are used. If the member is of source type SQLPLI, the margin values are the values specified on the SEU services display. If the member is of a different source type, the margin values are the default values of 2 and 72.

1-80 Specify the beginning position to be used for each input record.

**Element 2: Right margin**

1-80 Specify the ending position to be used for each input record.

**Date format (DATFMT)**

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

**Note:** An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA The United States date format **mm/dd/yyyy** is used.

*ISO The International Organization for Standardization (ISO) date format **yyyy-mm-dd** is used.

*EUR The European date format **dd.mm.yyyy** is used.

*JIS The Japanese Industrial Standard date format **yyyy-mm-dd** is used.

*MDY The date format **mm/dd/yy** is used.

*DMY The date format **dd/mm/yy** is used.

*YMD The date format **yy/mm/dd** is used.
*JUL  The Julian date format yy/ddd is used.

Date separator character (DATSEP)

Specifies the separator to be used when accessing date result columns.

Note: This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the Date format (DATFMT) parameter.

*JOB  The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

'|'  A slash is used as the date separator.
'.'  A period is used as the date separator.
'-'  A dash is used as the date separator.
','  A comma is used as the date separator.
'' or *BLANK  A blank is used as the date separator.

Time format (TIMFMT)

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

Note: An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS  The hh:mm:ss format is used.
*USA  The United States time format hh:mmxx is used, where xx is AM or PM.
*ISO  The International Organization for Standardization (ISO) time format hh.mm.ss is used.
*EUR  The European time format hh.mm.ss is used.
*JIS  The Japanese Industrial Standard time format hh:mm:ss is used.

Time separator character (TIMSEP)

Specifies the separator used when accessing time result columns.

Note: This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

*JOB  The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.
Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

'.' A colon is used as the time separator.

',' A period is used as the time separator.

',' A comma is used as the time separator.

',' or *BLANK
A blank is used as the time separator.

Replace (REPLACE)
Specifies whether a SQL program or SQL package is created when there is an existing SQL program or SQL package of the same name in the same library. The value is passed to the CRTxxxPGM command (where xxx is the language of the program being created) and the Create SQL Package (CRTSQLPKG) command if the RDB parameter is specified.

*YES An SQL program or SQL package is created and any existing SQL program or SQL package of the same name in the specified library is moved to QRPLOBJ. The authorities for the existing SQL package are kept for the new SQL package.

*NO An SQL program or package is not created if an SQL program or package of the same name already exists in the specified library.

RDB connect method (RDBCNNMTH)
Specifies the semantics used for CONNECT statements.

*DNU
CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RNU
CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

Default collection (DFTRDBCOL)
Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE
The naming convention specified for the Precompiler options (OPTION) parameter is used.

name Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.
Dynamic default collection (DYNDFTCOL)

Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.

*NO  Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.

*YES  The schema name specified for the DFTRDBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.

Package (SQLPKG)

Specifies the name and library of the SQL package to be created on the remote relational database specified for the Relational database (RDB) parameter of this command.

Qualifier 1: Package

*PGM  The name of the SQL package is the same as the program name.

name  Specify the name of the SQL package. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

Qualifier 2: Library

*PGMLIB  The SQL package is placed in the schema that has the same name as the library containing the program.

name  Specify the name of the schema where the SQL package is to be placed. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

SQL path (SQLPATH)

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

*NAMING  The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For *SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

*LIBL  The path used is the library list at runtime.

name  Specify one or more schema names. A maximum of 268 schema names may be specified.
SQL rules (SQLCURRULE)

Specifies the semantics used for SQL statements.

*DB2  The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

Hexadecimal constants are treated as character data.

*STD  The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:

Hexadecimal constants are treated as binary data.

IBM SQL flagging (SAAFLAG)

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG  No checks are made to see whether SQL statements conform to IBM SQL syntax.

*FLAG  Checks are made to see whether SQL statements conform to IBM SQL syntax.

ANS flagging (FLAGSTD)

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE  No checks are made to see whether SQL statements conform to ANSI standards.

*ANS  Checks are made to see whether SQL statements conform to standards.

Print file (PRTFILE)

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

QSYSNOPT

The precompiler output file is directed to the IBM-supplied printer file, QSYSNOPT. The file QSYSNOPT has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

name  Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LBR  All libraries in the job’s library list are searched until the first match is found.
*CURLIB

The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the printer file is located.

User profile (USRPRF)

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

*NAMING

The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.

*USER

The profile of the user running the program or SQL package is used.

*OWNER

The user profiles of both the owner and the user are used when the program or SQL package is run.

Dynamic user profile (DYNUSRPRF)

Specifies the user profile used for dynamic SQL statements.

*USER

Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

*OWNER

Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

Sort sequence (SRTSEQ)

Specifies the sort sequence table to be used for string comparisons in SQL statements.

Note: *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

Single values

*JOB The SRTSEQ value for the job is used.

*JOBRUN

The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.

*LINGIDUNQ

The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.
*LANGIDSHR
   The shared-weight sort table for the language specified for the LANGID parameter is used.

*HEX   A sort sequence table is not used. The hexadecimal values of the characters are used to determine
       the sort sequence.

Qualifier 1: Sort sequence
name   Specify the name of the sort sequence table to be used with this program.

Qualifier 2: Library
*LIBL   All libraries in the job’s library list are searched until the first match is found.
*CURLIB The current library for the job is searched. If no library is specified as the current library for the
       job, the QGPL library is used.
name   Specify the name of the library to be searched.

Language id (LANGID)
Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is
specified.

*JOB     The LANGID value for the job is retrieved during the precompile.
*JOBRUN  The LANGID value for the job is retrieved when the program is run. For distributed applications,
          LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.
language-id
          Specify the language identifier to be used by the program.

To source file (TOSRCFILE)
Specifies the source file that is to contain the output source member that has been processed by the SQL
precompiler. If the specified source file is not found, it will be created. The output member will have the
same name as the name specified for the SRCMBR parameter.

Qualifier 1: To source file
QSQLTEMP The source file QSQLTEMP will be used.
name   Specify the name of the source file to contain the output source member.

Qualifier 2: Library
QTEMP   The library QTEMP will be used.
*LIBL   The job’s library list is searched for the specified file. If the file is not found in any library in the
       library list, the file will be created in the current library.
**CURLIB**

The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.

**name** Specify the name of the library that is to contain the output source file.

---

**Decimal result options (DECRESULT)**

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

**Element 1: Maximum precision**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>The maximum precision (length) that should be returned for the result data types is 31 digits.</td>
</tr>
<tr>
<td>63</td>
<td>The maximum precision (length) that should be returned for the result data types is 63 digits.</td>
</tr>
</tbody>
</table>

**Element 2: Maximum scale**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.</td>
</tr>
<tr>
<td>0-63</td>
<td>Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.</td>
</tr>
</tbody>
</table>

**Element 3: Minimum divide scale**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.</td>
</tr>
<tr>
<td>0-9</td>
<td>Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot to exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.</td>
</tr>
</tbody>
</table>

---

**Compiler options (COMPILEOPT)**

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

**NONE**

No additional parameters will be used on the compiler command.

**character-value**

Specify no more than 5000 characters, enclosed in apostrophes.
Examples

CRTSQLPLI   PGM(PAYROLL)   TEXT('Payroll Program')

This command runs the SQL precompiler, which precompiles the PL/I source and stores the changed source in member PAYROLL of source file QSQLTEMP in library QTEMP. The PL/I compiler is called to create program PAYROLL in the current library using the source member created by the SQL precompiler.

Error messages

*ESCAPE Messages

SQL9001  SQL precompile failed.

SQL9002  Conflict in TGTRLS parameters for SQL precompile and &7 compile.

SQL9003  &7 Compile at wrong level for SQL source.

SQL9004  Create of SQL package failed.

SQL9006  DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Create SQL RPG Program (CRTSQLRPG)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Create SQL RPG Program (CRTSQLRPG) command calls the Structured Query Language (SQL) precompiler which precompiles RPG source containing SQL statements, produces a temporary source member, and then optionally calls the RPG compiler to compile the program.

If the Relational database (RDB) parameter is specified and a program is created, an SQL package will be created at the specified relational database.

Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGM</td>
<td>Program</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td>Qualifier 1: Program</td>
<td>Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td>Qualifier 1: Source file</td>
<td>Name, QRGPSRC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *PGM</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text ‘description’</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, ‘ ’</td>
<td>Optional</td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALWCOPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSQLCSR</td>
<td>Close SQL cursor</td>
<td>*ENDPGM, *ENDSQL, *ENDJOB</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, ‘/’, ‘.’, ‘,’ ‘,’ ‘,’ ‘,’ ‘,’ ‘,’ ‘,’ ‘,’平整</td>
<td>Optional</td>
</tr>
<tr>
<td>Keyword</td>
<td>Description</td>
<td>Choices</td>
<td>Notes</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, ː, ː, ː, ː, ː, ː, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Replace</td>
<td>*YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>RDBCNNMTH</td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td>DFTDFTCOL</td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNDFTCOL</td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPKG</td>
<td>Package</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Package</td>
<td>Name, *PGM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *PGMLIB</td>
<td></td>
</tr>
<tr>
<td>SQLPATH</td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Other values (up to 268 repetitions): Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQLCURRULE</td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td>SAAFLAG</td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td>FLAGSTD</td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td>PRTFILE</td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Print file</td>
<td>Name, QSYSPTRE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>USRPRF</td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNUSRPRF</td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Other values: Qualified object name</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Sort sequence</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>LANGID</td>
<td>Language id</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>TOSRCFILE</td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: To source file</td>
<td>Name, QSQLTEMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, QTTEMP, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>DECRERESULT</td>
<td>Decimal result options</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Element 1: Maximum precision</td>
<td>31, 63</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 2: Maximum scale</td>
<td>0-63, 31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 3: Minimum divide scale</td>
<td>0-9, 0</td>
<td></td>
</tr>
<tr>
<td>COMPILEOPT</td>
<td>Compiler options</td>
<td>Character value, *NONE</td>
<td>Optional</td>
</tr>
</tbody>
</table>

**Program (PGM)**

Specifies the program to be created.

This is a required parameter.

**Qualifier 1: Program**

*name* Specify the name of the program to be created.

**Qualifier 2: Library**

---

116 IBM Systems - iSeries: DB2 Query Manager and SQL Development Kit for iSeries Commands
**CURLIB**
The current library for the job is used to locate the compiled program. If no current library entry exists in the library list, QGPL is used.

name Specify the name of the library where the compiled program is located.

---

**Source file (SRCFILE)**
Specifies the source file that contains the RPG source statements and SQL statements.

Qualifier 1: Source file

**QRPGSRC**
Source file QRPGSRC contains the RPG source.

name Specify the name of the source file that contains the RPG source.

Qualifier 2: Library

*LIBL  All libraries in the job’s library list are searched until the first match is found.

*CURLIB  The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library to be searched.

---

**Source member (SRCMBR)**
Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the **Source file (SRCFILE)** parameter is a database file.

*PGM  The source file member that has the same name as the program name specified for the **Program (PGM)** parameter contains the input source.

name Specify the name of the source file member that contains the input source.

---

**Commitment control (COMMIT)**
Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR  Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS  Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.
*ALL or *RS
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC
Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

Relational database (RDB)
Specifies the name of the relational database where the SQL package is to be created.

*LOCAL
The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE
An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name
Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

Text ’description’ (TEXT)
Specifies text that briefly describes the program and its function.

*SRCMBRTXT
The text is taken from the source file member being used to create the program. If the source file is an inline file or a device file, the text is blank.

*BLANK
No text is specified.

’description’
Specify no more than 50 characters, enclosed in apostrophes.
**RDB user (USER)**

Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

*CURRENT

The user name associated with the current job is used.

name

Specify the user name to be used for the application server job.

---

**RDB user password (PASSWORD)**

Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.

*NONE

No password is sent. A user name cannot be specified for the **RDB user (USER)** parameter if this value is specified.

Note: Specifying a password of a blank is the same as specifying *NONE.

password

Specify the password of the user name specified for the USER parameter.

---

**Precompiler options (OPTION)**

Specifies whether the following options are used when the RPG source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

**Source listing** options:

*NO SRC or *NOSOURCE

The precompiler does not produce a source printout unless errors are detected during precompile or create package.

*SRC or *SOURCE

The precompiler produces a source printout.

**Cross reference** options:

*NOXREF

The precompiler does not produce a cross-reference of names.

*XREF

The precompiler produces a cross-reference between items declared in your program and the numbers of the statements in your program that refer to these items.

**Host language compiler call** options:

*GEN

The precompiler calls the RPG compiler. If a relational database name is specified for the **Relational database (RDB)** parameter, and the compile is successful, an SQL package is also created.

*NOGEN

The precompiler does not call the RPG compiler. Neither a program nor an SQL package is created.
Decimal point options:

*JOB    The representation for the decimal point specified for the job at precompile time is used.

Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric
constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a
comma followed by a blank. For example, \texttt{VALUES(1.1, 2,23, 4,1)} is equivalent to
\texttt{VALUES(1.1,2,23,4,1)} where the decimal point is the period.

*SYSVAL

The value used as the decimal point in numeric constants is from the QDECFMT system value.
This value is also used as the decimal point character when casting a numeric value to character.

Note: If QDECFMT specifies that the value used as the decimal point is a comma; any numeric
constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a
comma followed by a blank. For example, \texttt{VALUES(1,1, 2,23, 4,1)} is equivalent to
\texttt{VALUES(1.1,2,23,4,1)} where the decimal point is the period.

*PERIOD

The value used as the decimal point for numeric constants used in SQL statements is a period.
This value is also used as the decimal point character when casting a numeric value to character.

*COMMA

The value used as the decimal point in numeric constants is a comma. Any numeric constants in
lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed
by a blank. For example, \texttt{VALUES(1,1, 2,23, 4,1)} is equivalent to \texttt{VALUES(1.1,2,23,4,1)} where
the decimal point is the period.

Naming convention options:

*SYS    Specifies that the system naming convention is used (library-name/file-name).

*SQL    Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the \texttt{Relational database (RDB)} parameter, and the
database is on a system that is not an iSeries system, *SQL must be specified as the naming
convention.

Second-level message text options:

*NOSECLVL

Second-level text descriptions are not added to the listing.

*SECLVL

Second-level text with replacement data is added for all messages on the listing.

Debug listing view options:

*NOLSTDBG

Error and debug information is not generated.

*LSTDBG

The SQL precompiler generates a listing view and error and debug information required for this
view.

Note: You can only use *LSTDBG if you are using the CODE product to compile your program.

Sequence source options:

*NOSEQSRC

The source file member created into QSQLTEMP1 or QSQLTEMP has the same sequence numbers
as the original source read by the precompiler.
The source file member created into QSQLTEMP1 or QSQLTEMP contains sequence numbers starting at 000001 and incremented by 000001.

Target release (TGTRLS)

Specifies the release of the operating system on which you intend to use the object being created.

When specifying the target-release value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT

The object is to be used on the release of the operating system currently running on your system. The object can also be used on a system with any subsequent release of the operating system installed.

*PRV

The object is to be used on the previous release with modification level 0 of the operating system. The object can also be used on a system with any subsequent release of the operating system installed.

target-release

Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

INCLUDE file (INCFILE)

Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

Single values

*SRCFILE

The qualified source file you specify for the Source file (SRCFILE) parameter contains the source file members specified on any SQL INCLUDE statements.

Qualifier 1: INCLUDE file

ame

Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the Source file (SRCFILE) parameter.

Qualifier 2: Library

*LIBL

All libraries in the job’s library list are searched until the first match is found.

*CURLIB

The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.
name Specify the name of the library where the source file is located.

Allow copy of data (ALWCPYDTA)

Specifies whether a copy of the data can be used in a SELECT statement.

*OPTIMIZE

The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

*YES

A copy of the data is used only when necessary.

*NO

A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQCSR)

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks released. SQL cursors are explicitly closed by issuing the CLOSE, COMMIT (without HOLD), ROLLBACK (without HOLD), or CONNECT (Type 1) SQL statements.

*ENDPGM

The SQL cursors are closed and SQL prepared statements are discarded when the program ends. LOCK TABLE locks are released when the first SQL program on the call stack ends.

*ENDSQL

The SQL cursors remain open between calls and rows can be fetched without running another SQL OPEN statement. One of the programs higher on the call stack must have run at least one SQL statement. The SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the first SQL program on the call stack ends. If you specify *ENDSQL for a program that is the first SQL program called (the first SQL program on the call stack), the program is treated as if *ENDPGM was specified.

*ENDJOB

SQL cursors remain open between calls and can be fetched without running another SQL OPEN statement. The programs higher on the call stack do not need to have run SQL statements. SQL cursors are left open, SQL prepared statements are preserved, and LOCK TABLE locks are held when the first SQL program on the call stack ends. SQL cursors are closed, SQL prepared statements are discarded, and LOCK TABLE locks are released when the job ends.

Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.

*ALLREAD

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.
Specifying *ALLREAD:
• Allows record blocking for all read-only cursors.
• Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  – The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
  – Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

*NONE
Rows are not blocked for retrieval of data for cursors.
Specifying *NONE:
• Guarantees that the data retrieved is current.
• May reduce the amount of time required to retrieve the first row of data for a query.
• Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
• Can degrade the overall performance of a query that retrieves a large number of rows.

*READ
Records are blocked for read-only retrieval of data for cursors when:
• *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
• The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

Delay PREPARE (DLYPRP)
Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

*NO  Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

*YES  Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

Note: If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.
**Severity level (GENLVL)**

Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.

If the **Relational database (RDB)** parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10</strong></td>
<td>Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated.</td>
</tr>
<tr>
<td><strong>0-40</strong></td>
<td>Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called.</td>
</tr>
</tbody>
</table>

**Date format (DATFMT)**

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

**Note:** An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

- ***JOB** The format specified for the job at precompile time or when a new interactive SQL session is created is used.
  
  Use the Display Job (DSPJOB) command to determine the current date format for the job.

- ***USA** The United States date format mm/dd/yyyy is used.

- ***ISO** The International Organization for Standardization (ISO) date format yyyy-mm-dd is used.

- ***EUR** The European date format dd.mm.yyyy is used.

- ***JIS** The Japanese Industrial Standard date format yyyy-mm-dd is used.

- ***MDY** The date format mm/dd/yy is used.

- ***DMY** The date format dd/mm/yy is used.

- ***YMD** The date format yy/mm/dd is used.

- ***JUL** The Julian date format yy/ddd is used.

**Date separator character (DATSEP)**

Specifies the separator to be used when accessing date result columns.

**Note:** This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the **Date format (DATFMT)** parameter.

- ***JOB** The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.
Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

"   A slash is used as the date separator.
'.' A period is used as the date separator.
'-' A dash is used as the date separator.
',' A comma is used as the date separator.
'' or *BLANK
A blank is used as the date separator.

Time format (TIMFMT)

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

Note: An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS The hh:mm:ss format is used.
*USA The United States time format hh:mmxx is used, where xx is AM or PM.
*ISO The International Organization for Standardization (ISO) time format hh.mm.ss is used.
*EUR The European time format hh.mm.ss is used.
*JIS The Japanese Industrial Standard time format hh:mm:ss is used.

Time separator character (TIMSEP)

Specifies the separator used when accessing time result columns.

Note: This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

*JOB The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

':' A colon is used as the time separator.
'.' A period is used as the time separator.
'-' A comma is used as the time separator.
'' or *BLANK
A blank is used as the time separator.
Replace (REPLACE)

Specifies whether a SQL program or SQL package is created when there is an existing SQL program or SQL package of the same name in the same library. The value is passed to the CRTxxxPGM command (where xxx is the language of the program being created) and the Create SQL Package (CRTSQLPKG) command if the RDB parameter is specified.

*YES    An SQL program or SQL package is created and any existing SQL program or SQL package of the same name in the specified library is moved to QRPLOBJ. The authorities for the existing SQL package are kept for the new SQL package.

*NO     An SQL program or package is not created if an SQL program or package of the same name already exists in the specified library.

RDB connect method (RDBCNNMTH)

Specifies the semantics used for CONNECT statements.

*DUW    CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW    CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

Default collection (DFTRDBCOL)

Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE   The naming convention specified for the Precompiler options (OPTION) parameter is used.

name    Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

Dynamic default collection (DYNDFTCOL)

Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.

*NO     Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.

*YES    The schema name specified for the DFTRDBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.
Package (SQLPKG)

Specifies the name and library of the SQL package to be created on the remote relational database specified for the Relational database (RDB) parameter of this command.

Qualifier 1: Package

*PGM  The name of the SQL package is the same as the program name.

name  Specify the name of the SQL package. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

Qualifier 2: Library

*PGMLIB  The SQL package is placed in the schema that has the same name as the library containing the program.

name  Specify the name of the schema where the SQL package is to be placed. If the remote system is not an iSeries system, a maximum of 8 characters can be specified.

SQL path (SQLPATH)

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

*NAMING  The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For *SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

*LIBL  The path used is the library list at runtime.

name  Specify one or more schema names. A maximum of 268 schema names may be specified.

SQL rules (SQLCURRULE)

Specifies the semantics used for SQL statements.

*DB2  The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

Hexadecimal constants are treated as character data.

*STD  The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:

Hexadecimal constants are treated as binary data.
IBM SQL flagging (SAAFLAG)

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG
   No checks are made to see whether SQL statements conform to IBM SQL syntax.

*FLAG
   Checks are made to see whether SQL statements conform to IBM SQL syntax.

ANS flagging (FLAGSTD)

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE
   No checks are made to see whether SQL statements conform to ANSI standards.

*ANS
   Checks are made to see whether SQL statements conform to standards.

Print file (PRTFILE)

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

QSYSPRT
   The precompiler output file is directed to the IBM-supplied printer file, QSYSPRT. The file QSYSPRT has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

name
   Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIBL
   All libraries in the job’s library list are searched until the first match is found.

*CURLIB
   The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name
   Specify the name of the library where the printer file is located.

User profile (USRPRF)

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.
*NAMING

The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.

*USER
The profile of the user running the program or SQL package is used.

*OWNER
The user profiles of both the owner and the user are used when the program or SQL package is run.

Dynamic user profile (DYNUSRPRF)

Specifies the user profile used for dynamic SQL statements.

*USER
Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

*OWNER
Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

Sort sequence (SRTSEQ)

Specifies the sort sequence table to be used for string comparisons in SQL statements.

Note: *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

Single values

*JOB
The SRTSEQ value for the job is used.

*JOBRUN
The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.

*LANGIDUNQ
The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.

*LANGIDSHR
The shared-weight sort table for the language specified for the LANGID parameter is used.

*HEX
A sort sequence table is not used. The hexadecimal values of the characters are used to determine the sort sequence.

Qualifier 1: Sort sequence

name
Specify the name of the sort sequence table to be used with this program.

Qualifier 2: Library

*LIBL
All libraries in the job’s library list are searched until the first match is found.
**CURLIB**
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

*name* Specify the name of the library to be searched.

---

**Language id (LANGID)**
Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.

*JOB* The LANGID value for the job is retrieved during the precompile.

*JOBUN* The LANGID value for the job is retrieved when the program is run. For distributed applications, LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.

*language-id* Specify the language identifier to be used by the program.

---

**To source file (TOSRCFILE)**
Specifies the source file that is to contain the output source member that has been processed by the SQL precompiler. If the specified source file is not found, it will be created. The output member will have the same name as the name specified for the SRCMBR parameter.

**Qualifier 1: To source file**

*QSQLTEMP*
The source file QSQLTEMP will be used.

*name* Specify the name of the source file to contain the output source member.

**Qualifier 2: Library**

*QTEMP*
The library QTEMP will be used.

*LIBL* The job's library list is searched for the specified file. If the file is not found in any library in the library list, the file will be created in the current library.

*CURLIB* The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.

*name* Specify the name of the library that is to contain the output source file.
Decimal result options (DECRESULT)

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

Element 1: Maximum precision

| 31 | The maximum precision (length) that should be returned for the result data types is 31 digits. |
| 63 | The maximum precision (length) that should be returned for the result data types is 63 digits. |

Element 2: Maximum scale

| 31 | The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits. |
| 0-63 | Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision. |

Element 3: Minimum divide scale

| 0 | The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0. |
| 0-9 | Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot to exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used. |

Compiler options (COMPILEOPT)

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

*NONE

No additional parameters will be used on the compiler command.

character-value

Specify no more than 5000 characters, enclosed in apostrophes.

Examples

CRTSQLRPG   PGM(JONES/ARBR5)
            TEXT('Accounts Receivable Branch 5')

This command runs the SQL precompiler which precompiles the RPG source and stores the changed source in member ARBR5 of source file QSQLTEMP in library QTEMP. The RPG compiler is called to create program ARBR5 in library JONES by using the source member created by the SQL precompiler.
**Error messages**

*ESCAPE Messages*

**SQL9001**
SQL precompile failed.

**SQL9002**
Conflict in TGTRLS parameters for SQL precompile and &7 compile.

**SQL9003**
&7 Compile at wrong level for SQL source.

**SQL9004**
Create of SQL package failed.

**SQL9006**
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Create SQL ILE RPG Object (CRTSQLRPGI)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Create SQL ILE RPG Object (CRTSQLRPGI) command calls the Structured Query Language (SQL) precompiler which precompiles RPG source containing SQL statements, produces a temporary source member, and then optionally calls the ILE RPG compiler to create a module, create a program, or create a service program.

### Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJ</td>
<td>Object</td>
<td>Qualified object name</td>
<td>Required, Positional 1</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Object</td>
<td>Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Source file</td>
<td>Name, QRPGLESRC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name, *OBJ</td>
<td>Optional, Positional 3</td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>OBJTYPE</td>
<td>Compile type</td>
<td>*PGM, *SRVPGM, *MODULE</td>
<td>Optional</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>Listing output</td>
<td>*NONE, *PRINT</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text ‘description’</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, ’’</td>
<td>Optional</td>
</tr>
<tr>
<td>RPGPOPT</td>
<td>RPG preprocessor options</td>
<td>*NONE, *LV1, *LV2</td>
<td>Optional</td>
</tr>
<tr>
<td>TGRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT, *PRV</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>ALWCPDYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSQLC SR</td>
<td>Close SQL cursor</td>
<td>*ENACTGRP, *ENMOD</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, ’’, ’’, ’’, ’’, ’’, *BLANK</td>
<td>Optional</td>
</tr>
</tbody>
</table>
### Object (OBJ)

Specifies the object to be created.

This is a required parameter.

#### Qualifier 1: Object

**name** Specify the name of the object to be created.
Qualifier 2: Library

*CURLIB
The new object is created in the current library for the job. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the object is created.

Source file (SRCFILE)
Specifies the source file that contains the RPG source statements and SQL statements.

Qualifier 1: Source file

QRPGLESRC Source file QRPGLESRC contains the RPG source.

name Specify the name of the source file that contains the RPG source.

Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.

*CURLIB The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library to be searched.

Source member (SRCMBR)
Specifies the source file member that contains the input source. This parameter is used only if the source file specified for the Source file (SRCFILE) parameter is a database file.

*OBJ The source file member that has the same name as the value specified for the Object (OBJ) parameter contains the input source.

name Specify the name of the source file member that contains the input source.

Commitment control (COMMIT)
Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

*CHG or *UR Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are
locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or *RS
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC
Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

---

**Relational database (RDB)**

Specifies the name of the relational database where the SQL package is to be created.

*LOCAL
The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE
An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

---

**Compile type (OBJTYPE)**

Specifies the type of object to be created.

When OBJTYPE(*PGM) or OBJTYPE(*SRVPGM) is specified and the RDB parameter is also specified, the CRTSQLPKG command is issued by the SQL precompiler after the program has been created. When OBJTYPE(*MODULE) is specified, an SQL package is not created and you must issue the CRTSQLPKG command after the CRTPGM or CRTSRVPGM command has created the program.

If OPTION(*NOGEN) is specified, only the SQL temporary source member is generated. No module, program, service program, or SQL package is created.

*PGM  The SQL precompiler calls the compiler to create a program.

*MODULE   The SQL precompiler calls the compiler to create a module.
The SQL precompiler calls the compiler to create a module and issues the Create Service Program (CRTSRVPGM) command to create a service program.

### Listing output (OUTPUT)

Specifies whether the precompiler listing is generated.

- **NONE**: The precompiler listing is not generated.
- **PRINT**: The precompiler listing is generated.

### Text ’description’ (TEXT)

Specifies text that briefly describes the program and its function.

- **SRCMBRTXT**: The text is taken from the source file member being used to create the program. If the source file is an inline file or a device file, the text is blank.
- **BLANK**: No text is specified.

Specify no more than 50 characters, enclosed in apostrophes.

### RDB user (USER)

Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

- **CURRENT**: The user name associated with the current job is used.
- **name**: Specify the user name to be used for the application server job.

### RDB user password (PASSWORD)

Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.

- **NONE**: No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this value is specified.
  
  **Note**: Specifying a password of a blank is the same as specifying *NONE.

- **password**: Specify the password of the user name specified for the USER parameter.
Precompiler options (OPTION)

Specifies whether one or more of the following options are used when the RPG source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

Cross reference options:

*XREF  The precompiler cross-references items in the program to the statement numbers in the program that refer to those items.

*NOXREF  The precompiler does not cross-reference names.

Object creation options:

*GEN  The precompiler creates the object that is specified for the OBJTYPE parameter.

*Nogen  The precompiler does not call the RPG compiler. No module, program, service program, or SQL package is created.

Decimal point options:

*JOB  The representation for the decimal point specified for the job at precompile time is used.

  **Note:** If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

*SYSVAL  The value used as the decimal point in numeric constants is from the QDECFMT system value. This value is also used as the decimal point character when casting a numeric value to character.

  **Note:** If QDECFMT specifies that the value used as the decimal point is a comma; any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

*PERIOD  The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

*COMMA  The value used as the decimal point in numeric constants is a comma. Any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1,2,23,4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

Naming convention options:

*SYS  Specifies that the system naming convention is used (library-name/file-name).

*SQL  Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the Relational database (RDB) parameter, and the database is on a system that is not an iSeries system, *SQL must be specified as the naming convention.
Second-level message text options:

*NOSECLVL
Second-level text descriptions are not added to the listing.

*SECLVL
Second-level text with replacement data is added for all messages on the listing.

Sequence source options:

*NOSEQSRC
The source file member created into QSQLTEMP1 or QSQLTEMP has the same sequence numbers as the original source read by the precompiler.

*SEQSRC
The source file member created into QSQLTEMP1 or QSQLTEMP contains sequence numbers starting at 000001 and incremented by 000001.

LOB optimization for DRDA options:

*OPTLOB
The first FETCH for a cursor determines how the cursor will be used for LOBs (Large Objects) on all subsequent FETCHes. This option remains in effect until the cursor is closed.

  If the first FETCH uses a LOB locator to access a LOB column, no subsequent FETCH for that cursor can fetch that LOB column into a LOB host variable.

  If the first FETCH places the LOB column into a LOB host variable, no subsequent FETCH for that cursor can use a LOB locator for that column.

*NOOPTLOB
There is no restriction on whether a column is retrieved into a LOB locator or into a LOB host variable. This option can cause performance to degrade.

Event file creation options:

*NOEVENTF
The compiler will not produce an event file for use by CoOperative Development Environment (CODE).

*EVENTF
The compiler produces an event file for use by CoOperative Development Environment (CODE). The event file will be created as a member in the file EVFEVENT in your object library. CODE uses this file to offer error feedback integrated with the CODE editor. This option is normally specified by CODE on your behalf.

Character string representation options:

*NOCVTDT
Specifies that date, time, and timestamp data types which are retrieved from externally-described database files are to be processed using the date, time, and timestamp data types.

*CVTDT
Specifies that date, time and timestamp data types, which are retrieved from externally-described database files, are to be processed as fixed-length character fields.
RPG preprocessor options (RPGPOPOPT)

Specifies if the RPG compiler will be called to preprocess the source member before the SQL precompile is run. Preprocessing the SQL source member will allow some compiler directives to be handled before the SQL precompile. The preprocessed source will be placed in file QSQLPRE in QTEMP. This source will be used for the SQL precompile.

*NONE
   The compiler is not called for preprocessing.

*LVL1
   The compiler is called for preprocessing to expand /COPY and handle the conditional compilation directives except the /INCLUDE directive.

*LVL2
   The compiler will be called for preprocessing to expand /COPY and /INCLUDE and handle the conditional compilation directives.

Target release (TGTRLS)

Specifies the release of the operating system on which you intend to use the object being created.

When specifying the target-release value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT
   The object is to be used on the release of the operating system currently running on your system. The object can also be used on a system with any subsequent release of the operating system installed.

*PRV
   The object is to be used on the previous release with modification level 0 of the operating system. The object can also be used on a system with any subsequent release of the operating system installed.

target-release
   Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

INCLUDE file (INCFILE)

Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

Single values

*SRCFILE
   The qualified source file you specify for the Source file (SRCFILE) parameter contains the source file members specified on any SQL INCLUDE statements.

Qualifier 1: INCLUDE file
name Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the Source file (SRCFILE) parameter.

Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.

*CURLIB The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the source file is located.

Allow copy of data (ALWCPYDTA)

Specifies whether a copy of the data can be used in a SELECT statement.

*OPTIMIZE
The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the Commitment control (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

*YES A copy of the data is used only when necessary.

*NO A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

Close SQL cursor (CLOSQLCSR)

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released. SQL cursors are explicitly closed when the user issues the CLOSE, COMMIT, or ROLLBACK (without HOLD) SQL statements.

*ENDACTGRP
SQL cursors are closed and SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released when the activation group ends.

*ENDMOD
SQL cursors are closed and SQL prepared statements are implicitly discarded when the module is exited. LOCK TABLE locks are released when the first SQL program on the call stack ends.

Allow blocking (ALWBLK)

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.
**ALLREAD**

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying **ALLREAD**:
- Allows record blocking for all read-only cursors.
- Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  - The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when **ALLREAD** is specified.
  - Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

**NONE**

Rows are not blocked for retrieval of data for cursors.

Specifying **NONE**:
- Guarantees that the data retrieved is current.
- May reduce the amount of time required to retrieve the first row of data for a query.
- Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
- Can degrade the overall performance of a query that retrieves a large number of rows.

**READ**

Records are blocked for read-only retrieval of data for cursors when:
- **NONE** is specified for the **Commitment control (COMMIT)** parameter, which indicates that commitment control is not used.
- The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

---

**Delay PREPARE (DLYPRP)**

Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

**NO**

Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

**YES**

Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify **YES** for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

**Note:** If you specify **YES**, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.
**Severity level (GENLVL)**

Specifies whether the compiler is called, depending on the severity of messages generated as a result of errors found by the SQL precompiler. If precompiler errors are generated that have a message severity level greater than the value specified for this parameter, the compiler is not called.

If the **Relational database (RDB)** parameter is specified and the severity of the messages generated as a result of package creation is greater than the severity level specified for this parameter, the SQL package is not created.

10  Do not call the compiler if SQL precompiler messages with a message severity greater than 10 are generated.

0–40  Specify the maximum SQL precompiler message severity level to be used to control whether the compiler is called.

**Date format (DATFMT)**

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

**Note:** An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB  The format specified for the job at precompile time or when a new interactive SQL session is created is used.

   Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA  The United States date format mm/dd/yyyy is used.

*ISO  The International Organization for Standardization (ISO) date format yyyy-mm-dd is used.

*EUR  The European date format dd.mm.yyyy is used.

*JIS  The Japanese Industrial Standard date format yyyy-mm-dd is used.

*MDY  The date format mm/dd/yy is used.

*DMY  The date format dd/mm/yy is used.

*YMD  The date format yy/mm/dd is used.

*JUL  The Julian date format yy/ddd is used.

**Date separator character (DATSEP)**

Specifies the separator to be used when accessing date result columns.

**Note:** This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the **Date format (DATFMT)** parameter.
The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

'/' A slash is used as the date separator.

'.' A period is used as the date separator.

'-' A dash is used as the date separator.

',' A comma is used as the date separator.

' ' or *BLANK
A blank is used as the date separator.

**Time format (TIMFMT)**

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS The hh:mm:ss format is used.

*USA The United States time format hh:mmxx is used, where xx is AM or PM.

*ISO The International Organization for Standardization (ISO) time format hh.mm.ss is used.

*EUR The European time format hh.mm.ss is used.

*JIS The Japanese Industrial Standard time format hh:mm:ss is used.

**Time separator character (TIMSEP)**

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

*JOB The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

'.' A colon is used as the time separator.

'.' A period is used as the time separator.

',' A comma is used as the time separator.

' ' or *BLANK
A blank is used as the time separator.
Replace (REPLACE)

Specifies if a SQL module, program, service program or package is created when there is an existing SQL module, program, service program, or package of the same name and type in the same library. The value for this parameter is passed to the CRTRPGMOD, CRTBNDRPG, CRTSRVPGM, and CRTSQLPKG commands.

*YES  A new SQL module, program, service program, or package is created, any existing SQL object of the same name and type in the specified library is moved to QRPLOBJ.

*NO   A new SQL module, program, service program, or package is not created if an SQL object of the same name and type already exists in the specified library.

RDB connect method (RDBCNNMTH)

Specifies the semantics used for CONNECT statements.

*DUW  CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW  CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

Default collection (DFTRDBCOL)

Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE  The naming convention specified for the Precompiler options (OPTION) parameter is used.

name  Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

Dynamic default collection (DYNDFTCOL)

Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.

*NO   Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.
*YES  The schema name specified for the DFTRDBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.

---

**Package (SQLPKG)**

Specifies the qualified name of the SQL package created on the relational database specified for the RDB parameter of this command.

**Qualifier 1: Package**

*OBJ  The name of the SQL package is the same as the object name specified for the OBJ parameter.

name  Specify the name of the SQL package. If the remote system is not an iSeries system, no more than 8 characters can be specified.

**Qualifier 2: Library**

*OBJLIB  The package is created in the library with the same name as the library specified for the OBJ parameter.

name  Specify the name of the library where the package is created.

---

**SQL path (SQLPATH)**

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

*NAMING  The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For *SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRDBCOL parameter, the schema name takes the place of userid.

*LIBL  The path used is the library list at runtime.

name  Specify one or more schema names. A maximum of 268 schema names may be specified.

---

**SQL rules (SQLCURRULE)**

Specifies the semantics used for SQL statements.

*DB2  The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:

  Hexadecimal constants are treated as character data.

*STD  The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:
Hexadecimal constants are treated as binary data.

**IBM SQL flagging (SAAFLAG)**

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG  
No checks are made to see whether SQL statements conform to IBM SQL syntax.

*FLAG  
Checks are made to see whether SQL statements conform to IBM SQL syntax.

**ANS flagging (FLAGSTD)**

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE  
No checks are made to see whether SQL statements conform to ANSI standards.

*ANS  
Checks are made to see whether SQL statements conform to standards.

**Print file (PRTFILE)**

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

**QSYPRT**
The precompiler output file is directed to the IBM-supplied printer file, QSYPRT. The file QSYPRT has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

*name  
Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIBL  
All libraries in the job's library list are searched until the first match is found.

*CURLIB  
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

*name  
Specify the name of the library where the printer file is located.

**Debugging view (DBGVIEW)**

Specifies the type of source debug information to be provided by the SQL precompiler.
*NONE  
The source view will not be generated.

*SOURCE  
The SQL precompiler will provide the source views for the root and if necessary, SQL INCLUDE statements. A view is to be provided which contains the statements generated by the precompiler.

User profile (USRPRF)

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

*NAMING  
The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.

*USER  
The profile of the user running the program or SQL package is used.

*OWNER  
The user profiles of both the owner and the user are used when the program or SQL package is run.

Dynamic user profile (DYNUSRPRF)

Specifies the user profile used for dynamic SQL statements.

*USER  
Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

*OWNER  
Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

Sort sequence (SRTSEQ)

Specifies the sort sequence table to be used for string comparisons in SQL statements.

Note: *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

Single values

*JOB  
The SRTSEQ value for the job is used.

*JOBRUN  
The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.
*LANGIDUNQ
   The unique-weight sort table for the language specified for the Language id (LANGID)
   parameter is used.

*LANGIDSHR
   The shared-weight sort table for the language specified for the LANGID parameter is used.

*HEX
   A sort sequence table is not used. The hexadecimal values of the characters are used to determine
   the sort sequence.

Qualifier 1: Sort sequence
   name  Specify the name of the sort sequence table to be used with this program.

Qualifier 2: Library
   *LIBL     All libraries in the job’s library list are searched until the first match is found.
   *CURLIB
            The current library for the job is searched. If no library is specified as the current library for the
            job, the QGPL library is used.
   name     Specify the name of the library to be searched.

Language id (LANGID)

   Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is
   specified.
   *JOB     The LANGID value for the job is retrieved during the precompile.
   *JOBRUN
            The LANGID value for the job is retrieved when the program is run. For distributed applications,
            LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.
   language-id
            Specify the language identifier to be used by the program.

To source file (TOSRCFILE)

   Specifies the source file that is to contain the output source member that has been processed by the SQL
   precompiler. If the specified source file is not found, it will be created. The output member will have the
   same name as the name specified for the SRCMBR parameter. If this is an existing source file, it should
   have a record length of 112.

Qualifier 1: To source file
   QSQLTEMP1
            The source file QSQLTEMP1 will be used.
   name     Specify the name of the source file to contain the output source member.

Qualifier 2: Library
   QTEMP
            The library QTEMP will be used.
*LIBL  The job’s library list is searched for the specified file. If the file is not found in any library in the library list, the file will be created in the current library.

*CURLIB
The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.

name  Specify the name of the library that is to contain the output source file.

---

**Decimal result options (DECRESULT)**

Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

**Element 1: Maximum precision**

31  The maximum precision (length) that should be returned for the result data types is 31 digits.

63  The maximum precision (length) that should be returned for the result data types is 31 digits.

**Element 2: Maximum scale**

31  The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.

0-63 Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.

**Element 3: Minimum divide scale**

0  The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.

0-9 Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot to exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.

---

**Compiler options (COMPILEOPT)**

Specifies additional parameters to be used on the compiler command. The COMPILEOPT string is added to the compiler command built by the precompiler. If INCDIR is anywhere in the string, the precompiler will call the compiler using the SRCSTMF parameter. There is no validation of the string. The compiler command will issue an error if any parameter is incorrect. Please refer to the SQL Programming information in the iSeries Information Center at http://www.ibm.com/eserver/iseries/infocenter for a list of parameters that the precompiler generates for the compiler command. Using any of the keywords that the precompiler passes to the compiler will cause the compiler command to fail because of duplicate parameters.

*NONE
No additional parameters will be used on the compiler command.

character-value  Specify no more than 5000 characters, enclosed in apostrophes.
Examples

CRTSQLRPGI OBJ(PAYROLL) OBJTYPE(*PGM)
TEXT('Payroll Program')

This command runs the SQL precompiler which precompiles the RPG source and stores the changed source in member PAYROLL of source file QSQLTEMP1 in library QTEMP. The ILE RPG compiler is called to create program PAYROLL in the current library by using the source member created by the SQL precompiler.

Error messages

*ESCAPE Messages

SQL9001
SQL precompile failed.

SQL9002
Conflict in TGRLS parameters for SQL precompile and &7 compile.

SQL9003
&7 Compile at wrong level for SQL source.

SQL9004
Create of SQL package failed.

SQL9006
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.

SQL9019
SQL precompile failed.
Convert SQL C++ Source (CVTSQCPP)

Where allowed to run: All environments (*ALL)
Threadsafe: No

The Convert Structured Query Language C++ Source (CVTSQCPP) command calls the Structured Query Language (SQL) precompiler which precompiles C++ source containing SQL statements and produces an output source member. This source member can then be provided as input to the C++ cross compiler. For most C++ precompiles, the CRTSQLCPP command should be use.

Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRCFILE</td>
<td>Source file</td>
<td>Qualified object name</td>
<td>Required,</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: Source file</td>
<td>Name</td>
<td>Positional 1</td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>SRCMBR</td>
<td>Source member</td>
<td>Name</td>
<td>Required,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Positional 2</td>
</tr>
<tr>
<td>TOSRCFILE</td>
<td>To source file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: To source file</td>
<td>Name, *CALC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>RDB</td>
<td>Relational database</td>
<td>Simple name, *LOCAL, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>Listing output</td>
<td>*NONE, *PRINT</td>
<td>Optional</td>
</tr>
<tr>
<td>TEXT</td>
<td>Text ‘description’</td>
<td>Character value, *SRCMBRTXT, *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>USER</td>
<td>RDB user</td>
<td>Name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>RDB user password</td>
<td>Character value, *NONE, '40'</td>
<td>Optional</td>
</tr>
<tr>
<td>OPTION</td>
<td>Precompiler options</td>
<td>Values (up to 12 repetitions): *XREF, *NOXREF,</td>
<td>Optional,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*SYSVAL, *PERIOD, *COMMA, *EVENTF, *NOEVENTF,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>*SECLVL, *NOSECLVL, *OPTLOB, *NOOPTLOB</td>
<td></td>
</tr>
<tr>
<td>TGTRLS</td>
<td>Target release</td>
<td>Simple name, *CURRENT</td>
<td>Optional</td>
</tr>
<tr>
<td>INCFILE</td>
<td>INCLUDE file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Qualifier 1: INCLUDE file</td>
<td>Name, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy of data</td>
<td>*OPTIMIZE, *YES, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>CLOSQLCRS</td>
<td>Close SQL cursor</td>
<td>*ENDACTGRP, *ENDMOD</td>
<td>Optional</td>
</tr>
<tr>
<td>ALWBLK</td>
<td>Allow blocking</td>
<td>*ALLREAD, *NONE, *READ</td>
<td>Optional</td>
</tr>
<tr>
<td>DLYPRP</td>
<td>Delay PREPARE</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>GENLVL</td>
<td>Severity level</td>
<td>0-40, 10</td>
<td>Optional</td>
</tr>
<tr>
<td>MARGINS</td>
<td>Source margins</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Element 1: Left margin</td>
<td>1-32754, *SRCFILE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Element 2: Right margin</td>
<td>1-32754</td>
<td></td>
</tr>
<tr>
<td>Keyword</td>
<td>Description</td>
<td>Choices</td>
<td>Notes</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------</td>
<td>--------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, /, .., -, X'40', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, /, .., -, X'40', *BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>RDBCNNMTH</td>
<td>RDB connect method</td>
<td>*DUW, *RUW</td>
<td>Optional</td>
</tr>
<tr>
<td>DFTRDBCOL</td>
<td>Default collection</td>
<td>Name, *NONE</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNDFTCOL</td>
<td>Dynamic default collection</td>
<td>*NO, *YES</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLPKG</td>
<td>Package</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: Package</td>
<td>Name, *OBJ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *OBJLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQLPATH</td>
<td>SQL path</td>
<td>Single values: *NAMING, *LIBL</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLCURRULE</td>
<td>SQL rules</td>
<td>*DB2, *STD</td>
<td>Optional</td>
</tr>
<tr>
<td>SAAFLAG</td>
<td>IBM SQL flagging</td>
<td>*NOFLAG, *FLAG</td>
<td>Optional</td>
</tr>
<tr>
<td>FLAGSTD</td>
<td>ANS flagging</td>
<td>*NONE, *ANS</td>
<td>Optional</td>
</tr>
<tr>
<td>PRFILE</td>
<td>Print file</td>
<td>Qualified object name</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: Print file</td>
<td>Name, QSYSRPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBGVIEW</td>
<td>Debugging view</td>
<td>*NONE, *SOURCE</td>
<td>Optional</td>
</tr>
<tr>
<td>USRPRF</td>
<td>User profile</td>
<td>*NAMING, *USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>DYNUSRPRF</td>
<td>Dynamic user profile</td>
<td>*USER, *OWNER</td>
<td>Optional</td>
</tr>
<tr>
<td>Qualifier 1: Sort sequence</td>
<td>Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifier 2: Library</td>
<td>Name, *LIBL, *CURLIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LANGID</td>
<td>Language id</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>DECRERESULT</td>
<td>Decimal result options</td>
<td>Element list</td>
<td>Optional</td>
</tr>
<tr>
<td>Element 1: Maximum precision</td>
<td>31, 63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element 2: Maximum scale</td>
<td>0-63, 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element 3: Minimum divide scale</td>
<td>0-9, 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source file (SRCFILE)

Specifies the source file that contains the C++ source statements and SQL statements.

Qualifier 1: Source file

**QCSRC**

Source file QCSRC contains the C++ source.

**name** Specify the name of the source file that contains the C++ source.

Qualifier 2: Library

**LIBL** All libraries in the job’s library list are searched until the first match is found.
**CURLIB**

The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

`name` Specify the name of the library to be searched.

---

**Source member (SRCMBR)**

Specifies the name of the source file member that contains the C++ source.

---

**To source file (TOSRCFILE)**

Specifies the qualified name of the source file that is to contain the output C++ source member that has been processed by the SQL C++ precompiler. If the specified source file is not found, it will be created. The output member will have the same name as the name specified for the SRCMBR parameter.

**Qualifier 1: To source file**

* CALC

The output source file name will be generated based on the margins of the source file. The name will be QSQLTxxxxx, where xxxx is the width of the source file. If the source file record length is less than or equal to 92, the name will be QSQLTEMP.

`name` Specify the name of the source file to contain the output source member.

**Qualifier 2: Library**

* LIBL

The job’s library list is searched for the specified file. If the file is not found in any library in the library list, the file will be created in the current library.

* CURLIB

The current library for the job will be used. If no library is specified as the current library for the job, the QGPL library is used.

`name` Specify the name of the library that is to contain the output source file.

---

**Commitment control (COMMIT)**

Specifies whether SQL statements in the compiled program are run under commitment control. Files referred to in the host language source are not affected by this option. Only SQL tables, SQL views, and SQL packages referred to in SQL statements are affected.

* CHG or * UR

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

* CS

Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.
*ALL or *RS
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*NONE or *NC
Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used. If a relational database is specified for the Relational database (RDB) parameter, and the relational database is on a system that is not on an iSeries system, *NONE or *NC cannot be specified.

*RR Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

---

Relational database (RDB)
Specifies the name of the relational database where the SQL package is to be created.

*LOCAL
The program is created as a distributed SQL program. The SQL statements will access the local database. An SQL package object is not created as part of the precompile process. The Create Structured Query Language Package (CRTSQLPKG) command can be used.

*NONE
An SQL package object is not created. The program object is not a distributed program and the Create Structured Query Language Package (CRTSQLPKG) command cannot be used.

name Specify the name of the relational database where the new SQL package object is to be created. When the name of the local relational database is specified, the program created is still a distributed SQL program. The SQL statements will access the local database.

---

Listing output (OUTPUT)
Specifies whether the precompiler listing is generated.

*NONE
The precompiler listing is not generated.

*PRINT
The precompiler listing is generated.

---

Text 'description' (TEXT)
Specifies text that briefly describes the program and its function.

*SRCMBRTXT
The text is taken from the source file member being used to create the program. If the source file is an inline file or a device file, the text is blank.
*BLANK
   No text is specified.

'description'
   Specify no more than 50 characters, enclosed in apostrophes.

RDB user (USER)
Specifies the user name sent to the remote system when starting the conversation. This parameter is valid only when RDB is specified.

*CURRENT
   The user name associated with the current job is used.

name
   Specify the user name to be used for the application server job.

RDB user password (PASSWORD)
Specifies the password to be used on the remote system. This parameter is valid only when RDB is specified.

*NONE
   No password is sent. A user name cannot be specified for the RDB user (USER) parameter if this value is specified.

   Note: Specifying a password of a blank is the same as specifying *NONE.

password
   Specify the password of the user name specified for the USER parameter.

Precompiler options (OPTION)
Specifies whether one or more of the following options are used when the C++ source is precompiled. If an option is specified more than once, or if two options conflict, the last option specified is used.

Cross reference options:

*XREF
   The precompiler cross-references items in the program to the statement numbers in the program that refer to those items.

*NOXREF
   The precompiler does not cross-reference names.

Decimal point options:

*JOB
   The representation for the decimal point specified for the job at precompile time is used.

   Note: If QDECFMT specifies that the value used as the decimal point is a comma, any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1, 2,23, 4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.
*SYSVAL

The value used as the decimal point in numeric constants is from the QDECFMT system value. This value is also used as the decimal point character when casting a numeric value to character.

Note: If QDECFMT specifies that the value used as the decimal point is a comma; any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1, 2,23, 4,1) is equivalent to VALUES(1.1, 2.23, 4.1) where the decimal point is the period.

*PERIOD

The value used as the decimal point for numeric constants used in SQL statements is a period. This value is also used as the decimal point character when casting a numeric value to character.

*COMMA

The value used as the decimal point in numeric constants is a comma. Any numeric constants in lists (such as in the SELECT clause and VALUES clause) must be separated by a comma followed by a blank. For example, VALUES(1,1, 2,23, 4,1) is equivalent to VALUES(1.1,2.23,4.1) where the decimal point is the period.

Naming convention options:

*SYS Specifies that the system naming convention is used (library-name/file-name).

*SQL Specifies that the SQL naming convention is used (schema-name.table-name).

If a relational database is specified for the Relational database (RDB) parameter, and the database is on a system that is not an iSeries system, *SQL must be specified as the naming convention.

Second-level message text options:

*NOSECLVL Second-level text descriptions are not added to the listing.

*SECLVL Second-level text with replacement data is added for all messages on the listing.

NUL required options:

*NOCNULRQD For output character and graphic host variables, the NUL-terminator is not returned when the host variable is exactly the same length as the data. Input character and graphic host variables do not require a NUL-terminator.

*CNULRQD Output character and graphic host variables always contain the NUL-terminator. If there is not enough space for the NUL-terminator, the data is truncated and the NUL-terminator is added. Input character and graphic host variables require a NUL-terminator.

LOB optimization for DRDA options:

*OPTLOB The first FETCH for a cursor determines how the cursor will be used for LOBs (Large Objects) on all subsequent FETCHes. This option remains in effect until the cursor is closed.

If the first FETCH uses a LOB locator to access a LOB column, no subsequent FETCH for that cursor can fetch that LOB column into a LOB host variable.

If the first FETCH places the LOB column into a LOB host variable, no subsequent FETCH for that cursor can use a LOB locator for that column.
*NOOPTLOB
There is no restriction on whether a column is retrieved into a LOB locator or into a LOB host variable. This option can cause performance to degrade.

Event file creation options:

*NOEVENTF
The compiler will not produce an event file for use by CoOperative Development Environment (CODE).

*EVENTF
The compiler produces an event file for use by CoOperative Development Environment (CODE). The event file will be created as a member in the file EVFEVENT in your object library. CODE uses this file to offer error feedback integrated with the CODE editor. This option is normally specified by CODE on your behalf.

Target release (TGTRLS)
Specifies the release of the operating system on which you intend to use the object being created.

When specifying the target-release value, the format VxRxMx is used to specify the release, where Vx is the version, Rx is the release, and Mx is the modification level. For example, V5R3M0 is version 5, release 3, modification 0.

Valid values depend on the current version, release, and modification level of the operating system, and they change with each new release. You can press F4 while prompting this command parameter to see a list of valid target release values.

*CURRENT
The object is to be used on the release of the operating system currently running on your system. The object can also be used on a system with any subsequent release of the operating system installed.

*PRV
The object is to be used on the previous release with modification level 0 of the operating system. The object can also be used on a system with any subsequent release of the operating system installed.

target-release
Specify the release in the format VxRxMx. The object can be used on a system with the specified release or with any subsequent release of the operating system installed.

INCLUDE file (INCFILE)
Specifies the source file that contains members to be included in the program with the SQL INCLUDE statement.

Single values

*SRCFILE
The qualified source file you specify for the Source file (SRCFILE) parameter contains the source file members specified on any SQL INCLUDE statements.

Qualifier 1: INCLUDE file
Specify the name of the source file that contains the source file members specified on any SQL INCLUDE statements.

The record length of the source file you specify here must be no less than the record length of the source file you specify for the **source file** (SRCFILE) parameter.

**Qualifier 2: Library**

**LIBL** All libraries in the job’s library list are searched until the first match is found.

**CURLIB** The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

**name** Specify the name of the library where the source file is located.

**Allow copy of data (ALWCPYDTA)**

Specifies whether a copy of the data can be used in a SELECT statement.

**OPTIMIZE**

The system determines whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which method provides the best performance. If the **Commitment control** (COMMIT) parameter is not *NONE, the Allow blocking (ALWBLK) parameter should be set to *ALLREAD, when possible, for best performance.

**YES** A copy of the data is used only when necessary.

**NO** A copy of the data is not used. If a temporary copy of the data is required to perform the query, an error message is returned.

**Close SQL cursor (CLOSQCSR)**

Specifies when SQL cursors are implicitly closed, SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released. SQL cursors are explicitly closed when the user issues the CLOSE, COMMIT, or ROLLBACK (without HOLD) SQL statements.

**ENDACTGRP**

SQL cursors are closed and SQL prepared statements are implicitly discarded, and LOCK TABLE locks are released when the activation group ends.

**ENDMOD**

SQL cursors are closed and SQL prepared statements are implicitly discarded when the module is exited. LOCK TABLE locks are released when the first SQL program on the call stack ends.

**Allow blocking (ALWBLK)**

Specifies whether the database manager can use record blocking and the extent to which blocking can be used for read-only cursors.
**ALLREAD**

Rows are blocked for read-only cursors. All cursors in a program that are not explicitly able to be changed are opened for read-only processing even though there may be EXECUTE or EXECUTE IMMEDIATE statements in the program.

Specifying *ALLREAD:
- Allows record blocking for all read-only cursors.
- Can improve the performance of almost all read-only cursors in programs, but limits queries in the following ways:
  - The Rollback (ROLLBACK) command, a ROLLBACK statement in host languages, or the ROLLBACK HOLD SQL statement does not reposition a read-only cursor when *ALLREAD is specified.
  - Dynamic running of a positioned UPDATE or DELETE statement (for example, using EXECUTE IMMEDIATE), can not be used to update a row in a cursor unless the DECLARE statement for the cursor includes the FOR UPDATE clause.

**NONE**

Rows are not blocked for retrieval of data for cursors.

Specifying *NONE:
- Guarantees that the data retrieved is current.
- May reduce the amount of time required to retrieve the first row of data for a query.
- Stops the database manager from retrieving a block of data rows that is not used by the program when only the first few rows of a query are retrieved before the query is closed.
- Can degrade the overall performance of a query that retrieves a large number of rows.

**READ**

Records are blocked for read-only retrieval of data for cursors when:
- *NONE is specified for the Commitment control (COMMIT) parameter, which indicates that commitment control is not used.
- The cursor is declared with a FOR READ ONLY clause or there are no dynamic statements that could run a positioned UPDATE or DELETE statement for the cursor.

---

**Delay PREPARE (DLYPRP)**

Specifies whether the dynamic statement validation for a PREPARE statement is delayed until an OPEN, EXECUTE, or DESCRIBE statement is run. Delaying validation improves performance by eliminating redundant validation.

**NO**
Dynamic statement validation is not delayed. When the dynamic statement is prepared, the access plan is validated. When the dynamic statement is used in an OPEN or EXECUTE statement, the access plan is revalidated. Because the authority or the existence of objects referred to by the dynamic statement may change, you must still check the SQLCODE or SQLSTATE after issuing the OPEN or EXECUTE statement to ensure that the dynamic statement is still valid.

**YES**
Dynamic statement validation is delayed until the dynamic statement is used in an OPEN, EXECUTE, or DESCRIBE SQL statement. When the dynamic statement is used, the validation is completed and an access plan is built. If you specify *YES for this parameter for precompiled programs, you should check the SQLCODE and SQLSTATE after running an OPEN, EXECUTE, or DESCRIBE statement to ensure that the dynamic statement is valid.

**Note:** If you specify *YES, performance is not improved if the INTO clause is used on the PREPARE statement or if a DESCRIBE statement uses the dynamic statement before an OPEN is issued for the statement.
Severity level (GENLVL)

Specifies the severity level at which the convert operation fails. If errors occur that have a severity level greater than this value, the operation ends.

10  The convert operation fails if SQL precompiler messages with a message severity greater than 10 are generated.

0-40  Specify the maximum SQL precompiler message severity level to be used to control whether the convert operation fails.

Source margins (MARGINS)

Specifies the part of the precompiler input record that contains source text.

Element 1: Left margin

*SRCFILE

The left margin will be set to 1 and the right margin will be set to the record length of the input source file.

1-32754  Specify the beginning position to be used for each input record.

Element 2: Right margin

1-32754  Specify the ending position to be used for each input record.

Date format (DATFMT)

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

Note: An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB  The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA  The United States date format mm/dd/yyyy is used.

*ISO  The International Organization for Standardization (ISO) date format yyyy-mm-dd is used.

*EUR  The European date format dd.mm.yyyy is used.

*JIS  The Japanese Industrial Standard date format yyyy-mm-dd is used.

*MDY  The date format mm/dd/yy is used.
*DMY  The date format dd/mm/yy is used.
*YMD  The date format yy/mm/dd is used.
*JUL  The Julian date format yy/ddd is used.

**Date separator character (DATSEP)**

Specifies the separator to be used when accessing date result columns.

**Note:** This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the Date format (DATFMT) parameter.

*JOB  The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.

'/'  A slash is used as the date separator.
'. '  A period is used as the date separator.
'-'  A dash is used as the date separator.
'.'  A comma is used as the date separator.
'' or *BLANK  A blank is used as the date separator.

**Time format (TIMFMT)**

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

*HMS  The hh:mm:ss format is used.
*USA  The United States time format hh:mmxx is used, where xx is AM or PM.
*ISO  The International Organization for Standardization (ISO) time format hh.mm.ss is used.
*EUR  The European time format hh.mm.ss is used.
*JIS  The Japanese Industrial Standard time format hh:mm:ss is used.
### Time separator character (TIMSEP)

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

*JOB  
The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

- ':' A colon is used as the time separator.
- '.' A period is used as the time separator.
- ',' A comma is used as the time separator.
- '.' or *BLANK  
  A blank is used as the time separator.

### RDB connect method (RDBCNNMTH)

Specifies the semantics used for CONNECT statements.

*DUW  
CONNECT (Type 2) semantics are used to support distributed unit of work. Consecutive CONNECT statements to additional relational databases do not result in disconnection of previous connections.

*RUW  
CONNECT (Type 1) semantics are used to support remote unit of work. Consecutive CONNECT statements result in the previous connection being disconnected before a new connection is established.

### Default collection (DFTRDBCOL)

Specifies the name of the schema identifier used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers. This parameter applies only to static SQL statements.

*NONE  
The naming convention specified for the Precompiler options (OPTION) parameter is used.

**name** Specify the name of the schema identifier to be used instead of the naming convention specified for the OPTION parameter.

### Dynamic default collection (DYNDFTCOL)

Specifies whether the default schema name specified for the DFTRDBCOL parameter is also used for dynamic statements.

*NO  
Do not use the value specified for the DFTRDBCOL parameter for unqualified names of tables,
views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers for dynamic SQL statements. The naming convention specified for the Precompiler options (OPTION) parameter is used.

*YES  The schema name specified for the DFTRBCOL parameter will be used for the unqualified names of the tables, views, indexes, SQL packages, aliases, constraints, external programs, node groups, and triggers in dynamic SQL statements.

---

**Package (SQLPKG)**

Specifies the qualified name of the SQL package created on the relational database specified for the RDB parameter of this command.

**Qualifier 1: Package**

*OBJ  The name of the SQL package is the same as the object name specified for the OBJ parameter.

name  Specify the name of the SQL package. If the remote system is not an iSeries system, no more than 8 characters can be specified.

**Qualifier 2: Library**

*OBJLIB  The package is created in the library with the same name as the library specified for the OBJ parameter.

name  Specify the name of the library where the package is created.

---

**SQL path (SQLPATH)**

Specifies the path to be used to find procedures, functions, and user defined types in static SQL statements.

*NAMING  The path used depends on the naming convention specified for the Precompiler options (OPTION) parameter.

For *SYS naming, the path used is *LIBL, the current library list at runtime.

For *SQL naming, the path used is "QSYS", "QSYS2", "userid", where "userid" is the value of the USER special register. If a schema name is specified for the DFTRBCOL parameter, the schema name takes the place of userid.

*LIBL  The path used is the library list at runtime.

name  Specify one or more schema names. A maximum of 268 schema names may be specified.

---

**SQL rules (SQLCURRULE)**

Specifies the semantics used for SQL statements.

*DB2  The semantics of all SQL statements will default to the rules established for DB2. The following semantics are controlled by this option:
Hexadecimal constants are treated as character data.

*STD    The semantics of all SQL statements will default to the rules established by the ISO and ANSI SQL standards. The following semantics are controlled by this option:
Hexadecimal constants are treated as binary data.

**IBM SQL flagging (SAAFLAG)**

Specifies the IBM SQL flagging function. This parameter allows you to flag SQL statements to verify whether they conform to IBM SQL syntax.

*NOFLAG     No checks are made to see whether SQL statements conform to IBM SQL syntax.
*FLAG          Checks are made to see whether SQL statements conform to IBM SQL syntax.

**ANS flagging (FLAGSTD)**

Specifies whether non-standard statements are flagged. This parameter allows you to flag SQL statements to verify whether they conform to the Core level of the ISO/IEC 9075-2003 standards.

*NONE    No checks are made to see whether SQL statements conform to ANSI standards.
*ANS      Checks are made to see whether SQL statements conform to standards.

**Print file (PRTFILE)**

Specifies the printer device file to be used for the precompiler output listing.

Qualifier 1: Print file

QSYSRT    The precompiler output file is directed to the IBM-supplied printer file, QSYSRT. The file QSYSRT has a record length of 132. If you specify a file whose record length is less than 132, information is lost.

name Specify the name of the printer device file to which the precompiler output is directed.

Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.
*CURLIB    The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the printer file is located.
Debugging view (DBGVIEW)

Specifies the type of source debug information to be provided by the SQL precompiler.

*NONE  The source view will not be generated.

*SOURCE The SQL precompiler will provide the source views for the root and if necessary, SQL INCLUDE statements. A view is to be provided which contains the statements generated by the precompiler.

User profile (USRPRF)

Specifies the user profile that is used when the compiled program object and SQL package object is run, including the authority that the program object or SQL package has for each object in static SQL statements. The profile of either the owner or the user is used to control access to objects.

*NAMING  The user profile is determined by the naming convention. If the naming convention is *SQL, USRPRF(*OWNER) is used. If the naming convention is *SYS, USRPRF(*USER) is used.

*USER  The profile of the user running the program or SQL package is used.

*OWNER  The user profiles of both the owner and the user are used when the program or SQL package is run.

Dynamic user profile (DYNUSRPRF)

Specifies the user profile used for dynamic SQL statements.

*USER  Local dynamic SQL statements are run under the profile of the program’s user. Distributed dynamic SQL statements are run under the profile of the application server job.

*OWNER  Local dynamic SQL statements are run under the profile of the program’s owner. Distributed dynamic SQL statements are run under the profile of the SQL package’s owner.

Sort sequence (SRTSEQ)

Specifies the sort sequence table to be used for string comparisons in SQL statements.

Note: *HEX must be specified for this parameter on distributed applications where the application server is not on an iSeries system.

Single values

*JOB  The SRTSEQ value for the job is used.
*JOBRUN
The SRTSEQ value for the job is retrieved when the program is run. For distributed applications, SRTSEQ(*JOBRUN) is valid only when LANGID(*JOBRUN) is also specified.

*LANGIDUNQ
The unique-weight sort table for the language specified for the Language id (LANGID) parameter is used.

*LANGIDSHR
The shared-weight sort table for the language specified for the LANGID parameter is used.

*HEX
A sort sequence table is not used. The hexadecimal values of the characters are used to determine the sort sequence.

Qualifier 1: Sort sequence
name Specify the name of the sort sequence table to be used with this program.

Qualifier 2: Library

*LIBL All libraries in the job’s library list are searched until the first match is found.

*CURLIB
The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library to be searched.

Language id (LANGID)
Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.

*JOB The LANGID value for the job is retrieved during the precompile.

*JOBRUN
The LANGID value for the job is retrieved when the program is run. For distributed applications, LANGID(*JOBRUN) is valid only when SRTSEQ(*JOBRUN) is also specified.

language-id
Specify the language identifier to be used by the program.

Decimal result options (DECRESULT)
Specifies the maximum precision, maximum scale and minimum divide scale that should be returned for result data types. The specified limit only applies to numeric (zoned) and decimal (packed) data types used in arithmetic expressions and in SQL column functions AVG and SUM.

Element 1: Maximum precision

31    The maximum precision (length) that should be returned for the result data types is 31 digits.

63    The maximum precision (length) that should be returned for the result data types is 63 digits.

Element 2: Maximum scale
The maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types is 31 digits.

Specify the maximum scale (number of decimal positions to the right of the decimal point) that should be returned for the result data types. The value can range from 0 to the maximum precision.

Element 3: Minimum divide scale

The minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types is 0.

Specify the minimum divide scale (number of decimal positions to the right of the decimal point) that should be returned for both intermediate and result data types. The value cannot to exceed the maximum scale. If 0 is specified for the maximum scale, minimum divide scale is not used.

Examples

```
CVTSQLCPP SRCFILE(PAYLIB/QCSRC) SRCMBR(PAYROLL)
TOSRCFILE(PAYLIB/QSQLSRC)
```

This command runs the SQL precompiler which precompiles the C++ source in member PAYROLL of source file QCSRC in library PAYLIB, and stores the changed source in member PAYROLL of source file QSQLSRC in library PAYLIB.

Error messages

**ESCAPE Messages**

SQL9001

SQL precompile failed.

SQL9004

Create of SQL package failed.

SQL9006

DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.
Start DB2 UDB Query Manager (STRQM)

Where allowed to run: Interactive environments (*INTERACT *IPGM *IREXX *EXEC)
Threadsafe: No

The Start Query Manager (STRQM) command displays the DB2 UDB Query Manager main menu. From this menu, you can select options to work with Query Manager queries, report forms, tables, and profiles.

There are no parameters for this command.

Parameters

None

Examples

STRQM

This command displays the DB2 UDB Query Manager main menu. From this menu, you can select options to work with Query Manager queries, report forms, tables, and profiles.

Error messages

*ESCAPE Messages

QWM2701
    &1 command failed.

QWM2703
    &1 command ended.

QWM2707
    *LIBL not allowed when SQL naming applied.

QWM2709
    User or password not valid with relational database value.

QWM2710
    Password value *NONE only valid with user value *CURRENT.

QWM2712
    Character in user name not valid.
The Start Structured Query Language (STRSQL) command starts the interactive SQL program. The program starts the statement entry of the interactive SQL program which immediately shows the Enter SQL Statements display. This display allows you to build, edit, enter, and run a SQL statement in an interactive environment. Any messages during the running of the program are shown on this display.

### Parameters

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
<th>Choices</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAMING</td>
<td>Naming convention</td>
<td>*SYS, *SQL</td>
<td>Optional, Positional 1</td>
</tr>
<tr>
<td>PROCESS</td>
<td>Statement processing</td>
<td>*RUN, *VLD, *SYN</td>
<td>Optional, Positional 2</td>
</tr>
<tr>
<td>LISTTYPE</td>
<td>List type</td>
<td>*ALL, *SQL</td>
<td>Optional, Positional 4</td>
</tr>
<tr>
<td>REFRESH</td>
<td>Data refresh</td>
<td>*ALWAYS, *FORWARD</td>
<td>Optional, Positional 5</td>
</tr>
<tr>
<td>ALWCPYDTA</td>
<td>Allow copy data</td>
<td>*YES, *OPTIMIZE, *NO</td>
<td>Optional</td>
</tr>
<tr>
<td>DATSEP</td>
<td>Date separator character</td>
<td>*JOB, '/', ';', ',', '-', ',', '+', 'BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>TIMSEP</td>
<td>Time separator character</td>
<td>*JOB, ',', ',', ',', ',', ',', 'BLANK</td>
<td>Optional</td>
</tr>
<tr>
<td>DECPNT</td>
<td>Decimal point</td>
<td>*JOB, *PERIOD, *COMMA, *SYSVAL</td>
<td>Optional</td>
</tr>
<tr>
<td>LANGID</td>
<td>Language identifier</td>
<td>Character value, *JOB, *JOBRUN</td>
<td>Optional</td>
</tr>
<tr>
<td>SQLSTRDLIM</td>
<td>SQL string delimiter</td>
<td>*QUOTESQL, *APOSTSQL</td>
<td>Optional</td>
</tr>
</tbody>
</table>

### Commitment control (COMMIT)

Specifies whether SQL statements are run under commitment control.
*NONE or *NC
Specifies that commitment control is not used. Uncommitted changes in other jobs can be seen. If the SQL DROP SCHEMA statement is included in the program, *NONE or *NC must be used.

*CHG or *UR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs can be seen.

*CS
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows updated, deleted, and inserted are locked until the end of the unit of work (transaction). A row that is selected, but not updated, is locked until the next row is selected. Uncommitted changes in other jobs cannot be seen.

*ALL or *RS
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen.

*RR
Specifies the objects referred to in SQL ALTER, CALL, COMMENT ON, CREATE, DROP, GRANT, LABEL ON, RENAME, and REVOKE statements and the rows selected, updated, deleted, and inserted are locked until the end of the unit of work (transaction). Uncommitted changes in other jobs cannot be seen. All tables referred to in SELECT, UPDATE, DELETE, and INSERT statements are locked exclusively until the end of the unit of work (transaction).

Naming convention (NAMING)
Specifies the naming convention used for objects in SQL statements.

*SYS
The system naming convention (library-name/file-name) is used.

*SQL
The SQL naming convention (schema-name.table-name) is used.

Statement processing (PROCESS)
Specifies what values are used to process the statements.

*RUN
The statements are syntax checked, data checked, and then run.

*VLD
The statements are syntax checked and data checked but not run.

*SYN
The statements are syntax checked only.

Library option (LIBOPT)
Specifies the list of libraries that are shown when you request list support from the Enter SQL Statements display (F4, F16, F17, F18). If you do not have *EXECUTE authority for a specified library, that library is not shown.

*LIBL
All libraries in the job’s library list are searched until the first match is found.
*CURLIB
The job’s current library is shown.

*USRLIBL
Only the libraries in the user portion of the job’s library list are shown.

*ALL
All of the libraries in the system, including QSYS, are shown.

*ALLUSR
All user libraries are searched. All libraries with names that do not begin with the letter Q are searched except for the following:

- #CGULIB
- #DSULIB
- #SEULIB
- #COBLIB
- #RPGLIB
- #DFULIB
- #SDALIB

Although the following Qxxx libraries are provided by IBM, they typically contain user data that changes frequently. Therefore, these libraries are considered “user libraries”, and are also searched:

- QDSNX
- QRL
- QUSR
- QGPL
- QS
- QUSRV
- QPFR
- QUSRINS

Note: A different library name, of the form QUSRVxRxMx, can be created by the user for each release. VxRxMx is the version, release, and modification level of the library.

name Specify the name of the library to be shown.

List type (LISTTYPE)

Specifies what types of objects are displayed when you request list support from the Enter SQL Statements display (F16, F17, and F18) or from a prompt (F4) display.

- *ALL All objects are displayed.
- *SQL Only SQL created objects are displayed.

Data refresh (REFRESH)

Specifies when the display select output data is refreshed. This parameter does not apply to any SQL SELECT statements that require the creation of a temporary result.

- *ALWAYS The data is always refreshed. You cannot specify *ALWAYS for this parameter and *OPTIMIZE for the Allow copy of data (ALWCPYDTA) parameter.
- *FORWARD The data is refreshed only as the user pages forward to the end of the data for the first time. After that, it is not refreshed.

Allow copy of data (ALWCPYDTA)

Specifies whether a copy of the data can be used when running a SELECT statement.
A copy of the data can only be used, if necessary, to run a SELECT statement.

The system chooses whether to use the data retrieved directly from the database or to use a copy of the data. The decision is based on which choice provides the best performance.

This value decreases the time required for the total query. Since the copy of the data must be made before returning the first row of the result table, the time to retrieve the first row may be increased.

A copy of the data is not allowed. If the clauses in the SELECT statement require a copy of the data, an error message is returned. If the SELECT statement runs successfully, current data was used.

## Date format (DATFMT)

Specifies the format used when accessing date result columns. All output date fields are returned in the format you specify. For input date strings, the value you specify is used to determine whether the date is a valid format.

**Note:** An input date string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not an iSeries system, the format must be *USA, *ISO, *EUR, or *JIS.

*JOB The format specified for the job at precompile time or when a new interactive SQL session is created is used.

Use the Display Job (DSPJOB) command to determine the current date format for the job.

*USA The United States date format mm/dd/yyyy is used.

*ISO The International Organization for Standardization (ISO) date format yyyy-mm-dd is used.

*EUR The European date format dd.mm.yyyy is used.

*JIS The Japanese Industrial Standard date format yyyy-mm-dd is used.

*MDY The date format mm/dd/yy is used.

*DMY The date format dd/mm/yy is used.

*YMD The date format yy/mm/dd is used.

*JUL The Julian date format yy/ddd is used.

## Date separator character (DATSEP)

Specifies the separator to be used when accessing date result columns.

**Note:** This parameter applies only when *JOB, *MDY, *DMY, *YMD, or *JUL is specified for the Date format (DATFMT) parameter.

*JOB The date separator specified for the job at precompile time, when a new interactive SQL session is created, or when Run SQL Statement (RUNSQLSTM) command is run.

Use the Display Job (DSPJOB) command to determine the current date separator value for the job.
A slash is used as the date separator.

A period is used as the date separator.

A dash is used as the date separator.

A comma is used as the date separator.

A blank is used as the date separator.

---

**Time format (TIMFMT)**

Specifies the format used when accessing time result columns. All output time fields are returned in the format you specify. For input time strings, the value you specify is used to determine whether the time is specified in a valid format.

**Note:** An input time string that uses the format *USA, *ISO, *EUR, or *JIS is always valid.

If you connect to a relational database that is on a system that is not another iSeries system, the time format must be *USA, *ISO, *EUR, *JIS, or *HMS with a time separator of a colon or period.

- **HMS** The hh:mm:ss format is used.
- **USA** The United States time format hh:mmxx is used, where xx is AM or PM.
- **ISO** The International Organization for Standardization (ISO) time format hh.mm.ss is used.
- **EUR** The European time format hh.mm.ss is used.
- **JIS** The Japanese Industrial Standard time format hh:mm:ss is used.

---

**Time separator character (TIMSEP)**

Specifies the separator used when accessing time result columns.

**Note:** This parameter applies only when *HMS is specified for the Time format (TIMFMT) parameter.

- **JOB** The time separator specified for the job at precompile time, when a new interactive SQL session is created, or when RUNSQLSTM is run is used.

  Use the Display Job (DSPJOB) command to determine the current time separator value for the job.

- A colon is used as the time separator.
- A period is used as the time separator.
- A comma is used as the time separator.

- A blank is used as the time separator.
Decimal Point (DECMPT)

Specifies the decimal point character to be used for numeric constants in SQL statements. This value is also used as the decimal point character when casting between character and numeric values.

*JOB  The representation for the decimal point is the value used by the job running the statement.

*SYSVAL  The QDECFMT system value is used as the decimal point character.

*PERIOD  A period represents the decimal point.

*COMMA  A comma represents the decimal point.

Sort sequence (SRTSEQ)

Specifies the sort sequence table to be used for string comparisons in SQL statements on the Enter SQL Statements display.

Single values

*JOB  The SRTSEQ value is retrieved when the user starts interactive SQL.

*JOBRUN  The SRTSEQ value for the job is retrieved each time the user starts interactive SQL.

*LANGIDUNQ  A unique-weight sort table is used.

*LANGIDSHR  A shared-weight sort table is used.

*HEX  A sort sequence table is not used, and the hexadecimal values of the characters are used to determine the sort sequence.

Qualifier 1: Sort sequence

name  Specify the name of the sort sequence table to be used with the interactive SQL session.

Qualifier 2: Library

*LIBL  All libraries in the job’s library list are searched until the first match is found.

*CURLIB  The current library for the job is searched. If no library is specified as the current library for the job, the QGPL library is used.

name  Specify the name of the library to be searched.

Language identifier (LANGID)

Specifies the language identifier to be used when SRTSEQ(*LANGIDUNQ) or SRTSEQ(*LANGIDSHR) is specified.

*JOB  The LANGID value specified for the job is used when the user starts a new interactive SQL.
*JOBRUN

The LANGID value for the job is retrieved each time the user starts interactive SQL.

*language-ID

Specify the language identifier to be used.

Program language (PGMLNG)

Specifies the program language syntax rules to use. To use this parameter, you must specify *SYN for the Statement processing (PROCESS) parameter.

*NONE

You are not using a specific language’s syntax check rules.

*C

You are checking syntax using the C language syntax rules.

*CBL

You are checking syntax using the COBOL language syntax rules.

*PLI

You are checking syntax using the PL/I language syntax rules.

*RPG

You are checking syntax using the RPG language syntax rules.

*FTN

You are checking syntax using the FORTRAN language syntax rules.

SQL string delimiter (SQLSTRDLDM)

Specifies the SQL string delimiter if *CBL is specified for the Program language (PGMLNG) parameter.

*QUOTESQL

The SQL string delimiter is represented by the quotation mark (").

*APOSTSQL

The SQL string delimiter is represented by the apostrophe (‘).

Examples

STRSQL

This command starts the Interactive SQL program. The program starts the statement entry of the interactive SQL program which immediately shows the Enter SQL Statements display. This display allows you to build, edit, enter, and run a SQL statement in an interactive environment.

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.
CPF9810
Library &1 not found.

CPF9820
Not authorized to use library &1.

CPF9822
Not authorized to file &1 in library &2.

CPF9830
Cannot assign library &1.

SQL0113
Name &1 not allowed.

SQL6141
Cannot use interactive SQL now.

SQL6145
Interactive SQL session has exceeded system limit.

SQL6332
Authorization list &1 does not exist.

SQL6342
Sort sequence &1 is not valid.

SQL6343
Language identifier &1 is not valid.

SQL9006
DB2 UDB Query Manager and SQL Development Kit for iSeries not at same install level as i5/OS.

SQL9012
DB2 UDB Query Manager and SQL Development Kit for iSeries not available.
Appendix. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user’s responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
500 Columbus Avenue
Thornwood, NY8809
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this information and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement, or any equivalent agreement between us.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. You may copy, modify, and distribute these sample programs in any form without payment to IBM for the purposes of developing, using, marketing, or distributing application programs conforming to IBM’s application programming interfaces.

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:

(C) IBM 2006. Portions of this code are derived from IBM Corp. Sample Programs. (C) Copyright IBM Corp. 1998, 2006. All rights reserved.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

**Trademarks**

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

Advanced Function Printing
AFP
AS/400
CICS
COBOL/400
C/400
DataPropagator
DB2
IBM
Infoprint
InfoWindow
iSeries
LPDA
OfficeVision
i5/OS
Print Services Facility
RPG/400
SystemView
System/36
TCS
WebSphere

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.

**Terms and conditions**

Permissions for the use of these publications is granted subject to the following terms and conditions.

**Personal Use:** You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative works of these publications, or any portion thereof, without the express consent of IBM.

**Commercial Use:** You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of IBM.

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

IBM reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by IBM, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

IBM MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.