



**INTERNATIONAL STANDARD ISO/IEC 9075-4:2016**  
**TECHNICAL CORRIGENDUM 2**

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## **Information technology — Database languages — SQL — Part 4: Persistent stored modules (SQL/PSM)**

### **TECHNICAL CORRIGENDUM 2**

*Technologies de l'information — Langages de base de données — SQL — Partie 4: Modules  
stockés persistants (SQL/PSM)*

*RECTIFICATIF TECHNIQUE 2*

Technical Corrigendum 2 to ISO/IEC 9075-4:2016 was prepared by Joint Technical Committee  
ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.



## 4 Concepts

### 4.1 SQL-server modules

1. *Rationale: Clarify the precision of timestamps.*

Replace the 9<sup>th</sup> bullet of the 5<sup>th</sup> paragraph with:

- The creation timestamp, of an implementation-defined timestamp type.

## 5 Lexical elements

### 5.2 Names and identifiers

1. *Rationale: Add missing condition.*

Replace the lead text of Syntax Rule 5) b) with:

5) ...

- b) If *UDTN* is simply contained in <schema-resolved user-defined type name> and *UDTN* does not contain a <schema name>, then

Case:

## 9 Additional common elements

### 9.1 <routine invocation>

1. *Rationale: Supply the correct arguments.*

Replace Syntax Rule 4) with:

- 4) Replace SR 9)h)iii)5) If  $XA_i$  is an <SQL variable reference>, an <SQL parameter reference>, a <column reference>, or a <target array element specification>, then the Syntax Rules of Subclause 9.2, "Store assignment", in ISO/IEC 9075-2, are applied with  $XA_i$  as *TARGET* and  $P_i$  as *VALUE*.

NOTE 11 — The <column reference> can only be a new transition variable column reference.

## 11 Access control

### 11.2 <privileges>

1. *Rationale: Replace the use of "may" and clarify.*

Replace Syntax Rule 1) with:

- 1) Insert after SR 4)d) If the object identified by *ON* is an SQL-server module, then *AC* shall specify EXECUTE.

NOTE 2 — The Rule number above is the one after the application of the TC for SQL/Foundation.

### 11.3 <revoke statement>

1. *Rationale: Add missing containers of subject routines.*

Replace General Rule 8) with:

- 8) Insert after GR 29)a) EXECUTE privilege on every SQL-server module that includes one or more SQL-invoked routines that are among the subject routines of a <routine invocation>, <method invocation>, <static method invocation>, or <method reference> that is contained in the <SQL routine body> of *RD* or in the <parameter default> of any SQL parameter of *RD*.

2. *Rationale: Add missing containers of subject routines.*

Replace General Rules 9) a) and b) with:

- 9) ...
- a) EXECUTE privilege on every schema-level routine that is among the subject routines of a <routine invocation>, <method invocation>, <static method invocation>, or <method reference> that is contained in the <SQL routine body> of any SQL-invoked routine included in *SSM*.
  - b) EXECUTE privilege on every SQL-server module that includes one or more SQL-invoked routines that are among the subject routines of a <routine invocation>, <method invocation>, <static method invocation>, or <method reference> that is contained in the <SQL routine body> of any SQL-invoked routine included in *SSM*.

3. *Rationale: Use the correct BNF terms.*

Replace General Rule 9) e) with:

- 9) ...
- e) SELECT privilege on at least one column of each table identified by a <table reference> contained in a <search condition> contained in a <delete statement: searched>, an <update statement: searched>, or a <merge statement> contained in the <SQL routine body> of any SQL-invoked routine with an SQL security characteristic of DEFINER included in *SSM*.

## 12 SQL-client modules

### 12.2 <SQL procedure statement>

1. *Rationale: Address the case where there is no most appropriate handler.*

Replace General Rule 3) with:

- 3) Insert before GR 21 If *S* did not execute successfully, then
- a) Let *SST* be the value of the *SQLSTATE* associated with the unsuccessful execution of *S*.
  - b) If a handler *MAH* is the most appropriate handler for *SST*, then then the General Rules of Subclause 8.1, “Handler execution”, are applied with *MAH* as *MOST APPROPRIATE HANDLER*.
  - c) If no handler is activated and *SST* identifies an *SQLSTATE* value associated with an exception condition *EC*, then this is an unhandled exception condition and the <SQL procedure statement> that resulted in execution of *S* is terminated with the exception condition *EC*.

NOTE 3 — The General Rules of Subclause 15.2, “<handler declaration>” determine which handler will be invoked for the current condition.

## 15 Control statements

### 15.10 <loop statement>

1. *Rationale: Reinstate the repetition.*

Replace General Rule 1) with:

- 1) Let *SSL* be the <SQL statement list> and let *CCS* be the <compound statement>

BEGIN NOT ATOMIC *SSL* END

The General Rules of Subclause 13.4, “<SQL procedure statement>”, in ISO/IEC 9075-2, are applied with *CCS* as *EXECUTING STATEMENT*, repeatedly.

NOTE 26 — The occurrence of an exception condition or the execution of a <leave statement> may also cause execution of *LS* to be terminated; see Subclause 6.3.3.7, “Exceptions”, in ISO/IEC 9075-1, and Subclause 15.9, “<leave statement>”, respectively. Some actions taken by a condition handler might also cause execution of *LS* to be terminated; see Subclause 15.2, “<handler declaration>”.

## 19 Information Schema

### 19.4 MODULES view

1. *Rationale: Correct column name.*

Replace Conformance Rule 3) with:

- 3) Without Feature T011, “Timestamp in Information Schema”, conforming SQL language shall not reference `INFORMATION_SCHEMA.MODULES.CREATED`.

2. *Rationale: Delete reference to non-existent column.*

Delete Conformance Rule 4).

## 19.8 Short name views

1. *Rationale: Correct column name.*

Replace Conformance Rule 2) with:

- 2) Without Feature P003, “Information Schema views”, conforming SQL language shall not reference INFORMATION\_SCHEMA.MODULE\_COL\_USAGE.

2. *Rationale: Delete reference to non-existent column.*

Delete Conformance Rule 5).