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Information technology — Database languages — SQL —

Part 11: Information and Definition Schemas (SQL/Schemata)

TECHNICAL CORRIGENDUM 1

Technologies de l'information— Langages de base de données — SQL —

Partie 11: Information et Definition Schémas (SQL/Schemata)

RECTIFICATIE TECHNIQUE 1

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Statement of purpose for rationale:

A statement indicating the rational for each change to ISO/IEC 9075 is included. This is to inform the users of that standard as to the reason why it was judged necessary to change the original wording. In many cases, the reason is editorial or to clarify the wording; in some cases, it is to correct an error or an omission in the original wording.

Notes on numbering:

Where this Corrigendum introduces new Syntax, Access, General, and Conformance Rules, the new rules have been numbered as follows:

> Rules inserted between, for example, Rules 7) and 8) are numbered 7.1), 7.2), etc. [or 7)a.1), 7)a.2), etc.]. Those inserted before Rule 1) are numbered 0.1), 0.2, etc.

Where this Corrigendum introduces new Subclauses, the new Subclauses have been numbered as follows:

> Subclauses inserted between, for example, Subclause 4.3.2 and Subclause 4.3.3 are numbered 4.3.2a, 4.3.2b, etc. Those inserted before, for example, 4.3.1 are numbered 4.3.0, 4.3.0a, etc.

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Information technology — Database languages — SQL —

Part 11:
Information and Definition Schemas (SQL/Schemata)

TECHNICAL CORRIGENDUM 1

Foreword

1. *Rationale: Correct intent of this second edition.*

   Insert the following paragraph after the 5th paragraph:

   This first edition replaces parts of the the first editions of ISO/IEC 9075-2:1999 and ISO/IEC 9075-5:1999, which have been technically revised. It also incorporates the relevant parts of amendment ISO/IEC 9075-2:1999/Amd.1:2001 and of the Technical Corrigenda ISO/IEC 9075-2:1999/Cor.1:2001 and ISO/IEC 9075-2:1999/Cor.2:2001.

2. *Rationale: Remove incorrect reference to obsolete part.*

   In the 6th paragraph, delete the 5th bullet.

2 Normative references

2.1 JTC1 standards

1. *Rationale: Correct references to IS rather than FCD documents.*

   Replace the references [Framework] and [Foundation] with:

   [Framework] ISO/IEC 9075-1:2003, *Information technology — Database languages — SQL — Part 1: Framework (SQL/Framework).*

   [Foundation] ISO/IEC 9075-2:2003, *Information technology — Database languages — SQL — Part 2: Foundation (SQL/Foundation)*

5 Information Schema

5.14 COLLATIONS view

1. *Rationale: Replace Feature F691 with Feature F690.*

   Replace Conformance Rule 1) with:

   1) Without Feature F690, "Collation support", conforming SQL language shall not reference INFORMATION_SCHEMA.COLLATIONS.

5.17 COLUMN_DOMAIN_USAGE view

1. *Rationale: Add missing Conformance Rule.*

   Insert the following Conformance Rule:

   0.1) Without Feature F251, "Domain support", conforming SQL language shall not reference INFORMATION_SCHEMA.COLUMN_DOMAIN_USAGE.

5.28 ELEMENT_TYPES view

1. *Rationale: Replace incorrect reference to DTD_IDENTIFIER.*

   Replace the Definition with:

```
CREATE VIEW ELEMENT_TYPES AS
    SELECT DISTINCT
        OBJECT_CATALOG, OBJECT_SCHEMA, OBJECT_NAME,
        OBJECT_TYPE, COLLECTION_TYPE_IDENTIFIER, DATA_TYPE,
        CHARACTER_MAXIMUM_LENGTH, CHARACTER_OCTET_LENGTH,
        CHARACTER_SET_CATALOG, CHARACTER_SET_SCHEMA, CHARACTER_SET_NAME,
        COLLATION_CATALOG, COLLATION_SCHEMA, COLLATION_NAME,
        NUMERIC_PRECISION, NUMERIC_PRECISION_RADIX, NUMERIC_SCALE,
        DATETIME_PRECISION, INTERVAL_TYPE, INTERVAL_PRECISION,
        USER_DEFINED_TYPE_CATALOG AS UDT_CATALOG,
        USER_DEFINED_TYPE_SCHEMA AS UDT_SCHEMA,
        USER_DEFINED_TYPE_NAME AS UDT_NAME,
        SCOPE_CATALOG, SCOPE_SCHEMA, SCOPE_NAME,
        MAXIMUM_CARDINALITY, DTD_IDENTIFIER
    FROM DEFINITION_SCHEMA.ELEMENT_TYPES AS E
      JOIN
         DEFINITION_SCHEMA.DATA_TYPE_DESCRIPTOR AS D
      USING ( OBJECT_CATALOG, OBJECT_SCHEMA, OBJECT_NAME,
```

```
              OBJECT_TYPE, DTD_IDENTIFIER )
    WHERE ( OBJECT_CATALOG, OBJECT_SCHEMA, OBJECT_NAME,
            OBJECT_TYPE, ROOT_DTD_IDENTIFIER ) IN
          ( SELECT OBJECT_CATALOG, OBJECT_SCHEMA, OBJECT_NAME,
                   OBJECT_TYPE, DTD_IDENTIFIER
            FROM INFORMATION_SCHEMA.DATA_TYPE_PRIVILEGES );

GRANT SELECT ON TABLE ELEMENT_TYPES
    TO PUBLIC WITH GRANT OPTION;
```

5.31 KEY_COLUMN_USAGE view

1. *Rationale: Fix the invalid brackets in the KEY_COLUMN_USAGE view.*

   Replace the view definition with:

```
CREATE VIEW KEY_COLUMN_USAGE AS
  SELECT CONSTRAINT_CATALOG, CONSTRAINT_SCHEMA, CONSTRAINT_NAME,
         KCU1.TABLE_CATALOG, KCU1.TABLE_SCHEMA, KCU1.TABLE_NAME,
         KCU1.COLUMN_NAME, KCU1.ORDINAL_POSITION, KCU1.POSITION_IN_UNIQUE_CONSTRAINT
  FROM DEFINITION_SCHEMA.KEY_COLUMN_USAGE AS KCU1
       JOIN INFORMATION_SCHEMA.TABLE_CONSTRAINTS AS TC
         USING ( CONSTRAINT_CATALOG, CONSTRAINT_SCHEMA, CONSTRAINT_NAME )
  WHERE ( ( SELECT MAX ( KCU3.ORDINAL_POSITION )
            FROM DEFINITION_SCHEMA.KEY_COLUMN_USAGE AS KCU3
            WHERE KCU3.CONSTRAINT_CATALOG = CONSTRAINT_CATALOG
                  AND
                  KCU3.CONSTRAINT_SCHEMA = CONSTRAINT_SCHEMA
                  AND
                  KCU3.CONSTRAINT_NAME = CONSTRAINT_NAME
          ) = ( SELECT COUNT (*)
                FROM DEFINITION_SCHEMA.KEY_COLUMN_USAGE AS KCU2
                WHERE ( KCU2.TABLE_CATALOG, KCU2.TABLE_SCHEMA,
                        KCU2.TABLE_NAME, KCU2.COLUMN_NAME )
                        IN ( SELECT CP2.TABLE_CATALOG, CP2.TABLE_SCHEMA,
                                    CP2.TABLE_NAME, CP2.COLUMN_NAME
                             FROM DEFINITION_SCHEMA.COLUMN_PRIVILEGES AS CP2
                             WHERE ( CP2.GRANTEE IN ( 'PUBLIC',
                                                      CURRENT_USER )
                                     OR
                                     CP2.GRANTEE IN ( SELECT ROLE_NAME
                                                      FROM ENABLED_ROLES )
                                        )
                           )
                           AND
                           KCU2.CONSTRAINT_CATALOG = CONSTRAINT_CATALOG
                           AND
                           KCU2.CONSTRAINT_SCHEMA = CONSTRAINT_SCHEMA
                           AND
                           KCU2.CONSTRAINT_NAME = CONSTRAINT_NAME
              )
```



```
)
AND
CONSTRAINT_CATALOG = ( SELECT CATALOG_NAME
                         FROM INFORMATION_SCHEMA_CATALOG_NAME );
```

5.63 TRANSLATIONS view

1. *Rationale: Replace Feature F691 with Feature F695.*

   Replace Conformance Rule 1) with:

   2) Without Feature F695, "Translation support", conforming SQL language shall not reference INFORMATION_SCHEMA.TRANSLATIONS.

5.77 Short name views

1. *Rationale: Add missing Conformance Rule.*

   Insert the following Conformance Rules:

   1.1) Without Feature F251, "Domain support", conforming SQL language shall not reference INFORMATION_SCHEMA.COL_DOMAIN_USAGE.

2. *Rationale: Delete a Conformance Rule which references an incorrect table*

   Delete Conformance Rule 16)

3. *Rationale: Add missing Conformance Rules.*

   Insert the following Conformance Rules:

   16.1) Without Feature F341, "Usage tables", conforming SQL language shall not reference the INFORMATION_SCHEMA.TRIG_SEQ_USAGE_S view.

   16.2) Without Feature F341, "Usage tables", conforming SQL language shall not reference the INFORMATION_SCHEMA.COL_COL_USAGE view.

4. *Rationale: Replace Feature F691 with Features F690 and F695.*

   Replace Conformance Rules 19) and 20) with:

   19) Without Feature F690, "Collation support", conforming SQL language shall not reference INFORMATION_SCHEMA.COLLATIONS.

20) Without Feature F695, “Translation support”, conforming SQL language shall not reference INFORMATION_SCHEMA.TRANSLATIONS.

5. *Rationale: Reference the correct table.*

Replace Conformance Rule 21) with:

21) Without Feature F696, “Additional translation documentation”, conforming SQL language shall not reference TRANSLATIONS_S.TRANS_SRC_CATALOG, TRANSLATIONS_S.TRANS_SRC_SCHEMA, or TRANSLATIONS_S.TRANS_SRC_NAME.

6. *Rationale: Add missing Conformance Rules.*

Insert the following Conformance Rules:

25.1) Without Feature S024, “Enhanced structured types”, conforming SQL language shall not reference INFORMATION_SCHEMA.ROL_TAB_METH_GRNTS.

25.2) Without Feature S041, “Basic reference types”, conforming SQL language shall not reference INFORMATION_SCHEMA.REFERENCED_TYPES_S.

25.3) Without Feature S091, “Basic array support”, or Feature S271, “Basic multiset support”, conforming SQL language shall not reference INFORMATION_SCHEMA.ELEMENT_TYPES_S.

7. *Rationale: Reference the correct table.*

Replace Conformance Rule 30) with:

30) Without Feature T011, “Timestamp in Information Schema”, conforming SQL language shall not reference INFORMATION_SCHEMA.TRIGGERS_S.CREATED.

8. *Rationale: Add missing Conformance Rules.*

Insert the following Conformance Rules:

30.1) Without Feature T051, “Row types”, conforming SQL language shall not reference INFORMATION_SCHEMA.FIELDS_S.

30.2) Without Feature T175, “Generated columns”, conforming SQL language shall not reference INFORMATION_SCHEMA.COLUMNS_S.IS_GENERATED.

9. *Rationale: Add missing Conformance Rule.*

Insert the following Conformance Rules:

34.1) Without Feature T176, “Sequence generator support”, conforming SQL language shall not reference INFORMATION_SCHEMA.TRIGGER_SEQ_USAGE_S.

10. *Rationale: Delete a redundant Conformance Rule.*

    Delete Conformance Rule 39)

11. *Rationale: Add missing Conformance Rules.*

    Insert the following Conformance Rules:

    41.1) Without Feature T272, "Enhanced savepoint management", conforming SQL language shall not reference INFORMATION_SCHEMA.ROUTINES_S.NEW_SAVEPOINT_LEVEL.

    41.2) Without Feature T331, "Basic roles", conforming SQL language shall not reference INFORMATION_SCHEMA.ROL_TAB_METH_GRNTS.

6 Definition Schema

6.6 ATTRIBUTES base table

1. *Rationale: Nullability is not specied for attributes of structured types.*

   Replace description 6) with:

   6) The value of IS_NULLABLE is YES.

2. *Rationale: The description for the column IS_DERIVED_REFERENCE_ATTRIBUTE is missing.*

   Insert the following description item:

   6.1) The values of IS_DERIVED_REFERENCE_ATTRIBUTE have the following meanings:

YES	The attribute is used in the definition of a derived representation for the reference type corresponding to the structured type the attribute belongs to.
NO	The attribute is not used in the definition of a derived representation for the reference type corresponding to the structured type the attribute belongs to.

6.7 AUTHORIZATIONS base table

1. *Rationale: Use correct BNF term.*

   Replace the text of the Function with:

Function

The AUTHORIZATIONS table has one row for each <role name> and one row for each <user identifier> referenced in the Information Schema. These are the <role name>s and <user identifier>s that may grant privileges as well as those that may create a schema, or currently own a schema created through a <schema definition>.

6.27 FIELDS base table

1. *Rationale: Nullability is not specified for fields of row types.*

   Replace description 6) with:

   6) The value of IS_NULLABLE is YES.

6.34 ROLE_AUTHORIZATION_DESCRIPTORS base table

1. *Rationale: The primary key is incomplete.*

   Replace the declaration of the constraint ROLE_AUTHORIZATION_DESCRIPTORS_PRIMARY_KEY with:

```
CONSTRAINT ROLE_AUTHORIZATION_DESCRIPTORS_PRIMARY_KEY
  PRIMARY KEY ( ROLE_NAME, GRANTEE, GRANTOR ),
```

6.42 SEQUENCES base table

1. *Rationale: Fix the invalid constraint SEQUENCES_FOREIGN_KEY_SCHEMATA.*

   In the Table definition replace the constraint definition for constraint SEQUENCES_FOREIGN_KEY_SCHEMATA with:

```
CONSTRAINT SEQUENCES_FOREIGN_KEY_SCHEMATA
  FOREIGN KEY ( SEQUENCE_CATALOG, SEQUENCE_SCHEMA )
    REFERENCES SCHEMATA,
```


6.51 TABLES base table

1. *Rationale: SQL-92 compatability.*

   Replace Description 7) with:

   7) The values of IS_INSERTABLE_INTO have the following meanings:

      a) If the SQL implementation supports Feature T111, "Updatable joins, unions and columns", then

YES	The table being described is insertable-into.
NO	The table being described is not insertable-into.

      b) Otherwise,

YES	The table being described is insertable-into and simply updatable.
NO	The table being described is not insertable-into or not simply updatable.

6.66 VIEWS base table

1. *Rationale: SQL-92 compatability.*

   Replace Description 4) with:

   4) The values of IS_UPDATABLE have the following meanings:

YES	The view is effectively updatable.
NO	The view is not effectively updatable.

Annex C

(informative)

Deprecated features

1. *Rationale: Nullability is not specified for attributes of structured types or fields of row types.*

   Insert the following items:

   7) The column IS_NULLABLE of the ATTRIBUTES view has been deprecated.

   8) The column IS_NULLABLE of the FIELDS view has been deprecated.

Annex E

(informative)

SQL feature taxonomy

1. *Rationale: List missing optional features.*

   Insert the following rows to Table 3, “Feature taxonomy for optional features”:

Table 3 — Feature taxonomy for optional features

	Feature ID	Feature Name
1.1	**F251**	**Domain support**
4.1	**F521**	**Assertions**
4.2	**F651**	**Catalog name qualifiers**
4.3	**F690**	**Collation support**
4.4	**F695**	**Translation support**
4.5	**F696**	**Additional translation documentation**
6.1	**S041**	**Basic reference types**
6.2	**S081**	**Subtables**
6.3	**S091**	**Basic array support**

	Feature ID	Feature Name
6.4	**S241**	**Transform functions**
6.5	**S271**	**Basic multiset support**
7.1	**T051**	**Row types**