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Information technology — Database languages — SQL multimedia and application packages —

Part 3: Spatial

Technologies de l'information — Langages de bases de données — Multimédia SQL et paquetages d'application —

Partie 3: Spatial

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC 13249 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 13249-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

This fourth edition cancels and replaces the third edition (ISO/IEC 13249-3:2006), which has been technically revised.

ISO/IEC 13249 consists of the following parts, under the general title *Information technology — Database languages — SQL multimedia and application packages*:

— *Part 1: Framework*

— *Part 2: Full-Text*

— *Part 3: Spatial*

— *Part 5: Still image*

— *Part 6: Data mining*

— *Part 7: History*

Introduction

The purpose of ISO/IEC 13249 is to define multimedia and application specific types and their associated routines using the user-defined features in ISO/IEC 9075.

ISO/IEC 13249 is based on the content of ISO/IEC International Standard Database Language (SQL).

The organization of this part of ISO/IEC 13249 is as follows:

Clause 1, "Scope", specifies the scope of this part of ISO/IEC 13249.

Clause 2, "Normative references", identifies additional standards that, through reference in this part of ISO/IEC 13249, constitute provisions of this part of ISO/IEC 13249.

Clause 3, "Terms and definitions, notations, and conventions", defines the notations and conventions used in this part of ISO/IEC 13249.

Clause 4, "Concepts", presents concepts used in the definition of this part of ISO/IEC 13249.

Clause 5, "Geometry Types", defines the geometry supertype.

Clause 6, "Point Types", defines primitive 0-dimensional geometry types.

Clause 7, "Curve Types", defines primitive 1-dimensional geometry types.

Clause 8, "Surface Types", defines primitive 2-dimensional geometry types.

Clause 9, "Geometry Collection Types", defines the geometry collection types.

Clause 10, "Topology-Geometry", defines node, edge, and face topology-geometry primitives.

Clause 11, "Topology-Network", defines node and link topology-network primitives.

Clause 12, "General Routines", defines the routines to determine shortest path in directed or undirected graphs.

Clause 13, "Spatial Reference System Type", defines the user-defined type to manage spatial reference systems.

Clause 14, "Angle and Direction Types", defines the angles and direction types.

Clause 15, "Support Types", defines supporting types and routines used by this part of ISO/IEC 13249.

Clause 16, "Support Routines", defines supporting functions and procedures used by this part of ISO/IEC 13249.

Clause 17, "SQL/MM Spatial Information Schema" defines the SQL/MM Spatial Information Schema.

Clause 18, "SQL/MM Spatial Definition Schema" defines the SQL/MM Spatial Definition Schema.

Clause 19, "Status Codes", defines the SQLSTATE codes used in this part of ISO/IEC 13249.

Clause 20, "Conformance", defines the criteria for conformance to this part of ISO/IEC 13249.

Annex A, "Implementation-defined elements", is an informative annex. It lists those features for which the body of this part of ISO/IEC 13249 states that the syntax or meaning or effect on the database is partly or wholly implementation-defined, and describes the defining information that an implementer needs to provide in each case.

Annex B, "Implementation-dependent elements", is an informative annex. It lists those features for which the body of this part of ISO/IEC 13249 states explicitly that the meaning or effect on the database is implementation-dependent.

Annex C, "Deprecated features", is an informative annex. It lists features that the responsible Technical Committee intend will not appear in a future revised version of this part of ISO/IEC 13249.

Annex D, "Incompatibilities with ISO/IEC 13249-3:2006", is an informative annex. It lists incompatibilities with the previous version of this part of ISO/IEC 13249-3.

Annex E, "Geometry Type Hierarchy", is an informative annex. It visually describes the inheritance relationship between user-defined types in this part of ISO/IEC 13249.

Bibliography is the last informative annex. It is a list of selective reading relating to this part of ISO/IEC 13249.

In the text of this part of ISO/IEC 13249, in Clause 5, "Geometry Types", through Clause 18, "SQL/MM Spatial Definition Schema", subclauses begin on a new page. Any resulting blank space is not significant.

The spatial user-defined types defined in this part of ISO/IEC 13249 adhere to the following:

— A spatial user-defined type is generic to spatial data handling. It addresses the need to store, manage and retrieve information based on aspects of spatial data such as geometry, location, and topology.

— A spatial user-defined type does not redefine the database language SQL directly or in combination with another spatial data type.

Implementations of this part of ISO/IEC 13249 can exist in environments that also support geographic information, decision support, data mining, and data warehousing systems.

Application areas addressed by implementations of this part of ISO/IEC 13249 include, but are not restricted to, automated mapping, desktop mapping, facilities management, geoengineering, graphics, location based services, multimedia, and resource management applications.

Information technology — Database languages — SQL multimedia and application packages —

Part 3: Spatial

1 Scope

This part of ISO/IEC 13249 defines

a) concepts specific to this part of ISO/IEC 13249, and

b) spatial user-defined types and their associated routines.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 13249-1, *Information technology — Database languages — SQL multimedia and application packages — Part 1: Framework*

ISO 19107, *Geographic information — Spatial schema*

ISO 19111, *Geographic information — Spatial referencing by coordinates*

ISO 19136, *Geographic information — Geography Markup Language (GML)*

IEC 559:1989, *Binary floating-point arithmetic for microprocessor systems*