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Part 8: Multi-dimensional arrays (SQL/MDA)

Langages de base de données IT — SQL rapport techniques —

Partie 8: Tableaux multidimensionnels

Reference number
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Foreword

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

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NOTE 1 — The individual parts of multi-part standards are not necessarily published together. New editions of one or more parts may be published without publication of new editions of other parts.

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Introduction

This Technical Report describes the definition and use of multi-dimensional arrays in SQL. Multidimensional arrays represent a core underlying structure of manifold science and engineering data. It is generally recognized today, therefore, that arrays have an essential role in Big Data and should become an integral part of the overall data type orchestration in information systems. This Technical Report discusses the syntax and semantics of operations on the MD-array data type defined in ISO/IEC 9075-15.

The organization of this Technical Report is as follows:

1) Clause 1, “Scope”, specifies the scope of this Technical Report.

2) Clause 2, “Normative references”, identifies standards that are referenced by this Technical Report.

3) Clause 4, “Multidimensional Arrays (MDA) concepts”, introduces the concept of Multidimensional Arrays.

4) Clause 5, “SQL/MDA data model”, introduces the data model.

5) Clause 6, “SQL/MDA operations”, covers the supported operations on MD-arrays..

6) Clause 7, “Remote sensing example”, illustrates the supported functionality through realistic examples.

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Information technology database languages — SQL technical reports —

Part 8:
Multi-dimensional arrays (SQL/MDA)

1 Scope

This Technical Report describes the support in SQL for Multi-Dimensional Arrays (MDA) as defined in ISO/IEC 9075-15.

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2 Normative references

There are no normative references in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp.

— IEC Electropedia: available at http://www.electropedia.org/.

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 **coordinate**
non-empty ordered list of integers

3.2 **cardinality**
number of elements in an MD-array

3.3 **MD-array**
ordered collection of elements of the same type associated with an MD-extent where each element is 1:1 associated with some coordinate within its MD-extent.

NOTE 2 — A coordinate is within an MD-extent if every coordinate value from the integer list is greater than or equal to the lower limit, and less than or equal to the upper limit of the MD-interval of the MD-axis at the position in the MD-extent as the coordinate value has within the coordinate

3.4 **MD-axis**
named MD-interval

3.5 **MD-dimension**
number of MD-axes in the MD-extent of an MD-array

NOTE 3 — Also known as “rank” outside of SQL/MDA

3.6 **MD-extent**
non-empty ordered collection of MD-axes with no duplicate names

3.7 **MD-interval**
integer interval given by a pair of lower and upper integer limits such that the lower limit is less than or equal to the upper limit; the interval is closed, *i.e.*, both limits are contained in it

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