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Part 8: Multidimensional arrays

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Partie 8: Matrices multidimensionnelles

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Foreword

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— ISO/IEC 9075-2, sixth edition or later,

— ISO/IEC 9075-3, sixth edition or later,

— ISO/IEC 9075-4, seventh edition or later,

— ISO/IEC 9075-9, fifth edition or later,

— ISO/IEC 9075-10, fifth edition or later,

— ISO/IEC 9075-11, fifth edition or later,

— ISO/IEC 9075-13, fifth edition or later,

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Introduction

This document describes the definition and use of multidimensional 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 document discusses the syntax and semantics of operations on the MD-array data type defined in ISO/IEC 9075-15.

The organization of this document is as follows:

1) Clause 1, "Scope", specifies the scope of this document.
2) Clause 2, "Normative references", identifies standards that are referenced by this document.
3) Clause 3, "Terms and definitions", defines the terms and definitions used in this document.
4) Clause 4, "Multidimensional arrays (MDA) concepts", introduces the concept of Multidimensional Arrays.
5) Clause 5, "SQL/MDA data model", introduces the data model.
6) Clause 6, "SQL/MDA operations", covers the supported operations on MD-arrays.
7) Clause 7, "Remote sensing example", illustrates the supported functionality through realistic examples.

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Information technology — Guidance for the use of database language SQL —

Part 8:
Multidimensional arrays

1 Scope

This document describes the definition and use of multidimensional 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 document discusses the syntax and semantics of operations on the MD-array data type defined in ISO/IEC 9075-15.

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2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 9075-1, *Information technology — Database languages — SQL — Part 1: Framework (SQL/Framework)*

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

ISO/IEC 9075-15, *Information technology — Database languages — SQL — Part 15: Multidimensional Arrays (SQL/MDA)*

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3 Terms and definitions

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

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

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

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

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 1 to entry: 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 1 to entry: 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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