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Part 6: SQL support for JavaScript Object Notation (JSON)

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Partie 6: Support de SQL pour JavaScript Object Notation (JSON)

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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.*

A list of all parts in the ISO/IEC 19075 series can be found on the ISO website.

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

Introduction

The organization of this part of ISO/IEC 19075 is as follows:

1) Clause 1, “Scope”, specifies the scope of this part of ISO/IEC 19075.

2) Clause 2, “Normative references”, identifies additional standards that, through reference in this part of ISO/IEC 19075, constitute provisions of this part of ISO/IEC 19075.

3) Clause 3, “JavaScript Object Notation (JSON)”, introduces what is JSON.

4) Clause 4, “The SQL/JSON data model”, introduces the data model that is used by the SQL/JSON functions and the SQL/JSON path language.

5) Clause 5, “SQL/JSON functions”, introduces the SQL/JSON functions to query and construct JSON.

6) Clause 6, “SQL/JSON path language”, introduces the SQL/JSON path language.

Information technology — Database languages — SQL Technical Reports —

Part 6:
SQL support for JavaScript Object Notation (JSON)

1 Scope

This Technical Report describes the support in SQL for JavaScript Object Notation.

This Technical Report discusses the following features of the SQL language:

— Storing JSON data.

— Publishing JSON data.

— Querying JSON data.

— SQL/JSON data model and path language.

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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.

2.1 ISO and IEC standards

[ISO9075-2] ISO/IEC 9075-2:2016, *Information technology — Database languages — SQL — Part 2: Foundation (SQL/Foundation)*

2.2 Other international standards

[ECMAscript] ISO/IEC 16262:2011, Information technology — Programming languages, their environments and system software interfaces — ECMAScript language specification; also available as *ECMAScript Language Specification*,
http://www.ecma-international.org/publications/files/ecma-st/ECMA-262.pdf

[Unicode] The Unicode Standard,
http://unicode.org

[RFC7159] Internet Engineering Task Force, RFC 7159, *The JavaScript Object Notation (JSON) Data Interchange Format*, March 2014,
https://tools.ietf.org/rfc/rfc7159.txt

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3 JavaScript Object Notation (JSON)

3.1 What is JSON?

JSON (an acronym for “JavaScript Object Notation”) is both a notation (that is, a syntax) for representing data and an implied data model. JSON is not an object-oriented data model; that is, it does not define sets of classes and methods, type inheritance, or data abstraction. Instead, JSON “objects” are simple data structures, including arrays. [RFC7159] says that JSON is a text format for the serialization of structured data. Its initial intended use was as a data transfer syntax.

The complete syntax of JSON is specified in [RFC7159].

The first-class components of the JSON data model are JSON values. A JSON value is one of the following: JSON object, JSON array, JSON string, JSON number, or one of the JSON literals: true, false, and null. A JSON object is zero or more name-value pairs and is enclosed in curly braces — `{ }`. A JSON array is an ordered sequence of zero or more values and is enclosed in square brackets — `[ ]`.

Here is an example of a JSON object:

```
{ "Name" : "Isaac Newton",
  "Weight" : 80,
  "Famous" : true,
  "Phone" : null }
```


The name-value pairs are separated by commas, and the names are separated from the values by colons. The names are always strings and are enclosed in (double) quotation marks.

Here is an example of a JSON array:

```
[ "Robert J. Oppenheimer", 98, false, "Beechwood 45789" ]
```

In a JSON array, the values are separated by commas. JSON arrays and objects are fully nestable. That is, values in both JSON objects and JSON arrays may be JSON strings, JSON numbers, JSON Booleans (represented by the JSON literals true and false), JSON nulls (represented by the JSON literal null), JSON objects, or JSON arrays.

JSON can be used to represent associative arrays — arrays whose elements are addressed by content, not by position. An associative array can be represented in JSON as a JSON object whose members are name-value pairs; the name is used as the “index” into the “array” — that is, to locate the appropriate member in the object — and the value is used as the content of the appropriate member. Here is such an associative array:

```
{ "Isaac Newton" : "apple harvester" ,
  "Robert J. Oppenheimer": "security risk" ,
  "Albert Einstein" : "patent clerk" ,
  "Stephen Hawking" : "inspiration" }
```

An extremely important part of JSON’s design is that it is inherently schema-less. Any JSON object can be modified by adding new name-value pairs, even with names that were never considered when the object was