Technical Report

ISO/IEC TR 19583-21

Second edition
2025-03

Information technology — Concepts and usage of metadata —

Part 21: 11179-3, -31, -32 Data model in SQL

Technologies de l'information — Concepts et utilisation des métadonnées —

Partie 21: Modèle de données en SQL 11179-3, -31, -32

Reference number
ISO/IEC TR 19583-21:2025(en)

© ISO/IEC 2025



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 The relationship among ISO/IEC 11179-3, ISO/IEC 11179-31 and ISO/IEC 11179-32 ... **1**
4.1 Overview ... 1
4.2 ISO/IEC 11179-3 — Metamodel for registry common facilities ... 1
4.3 ISO/IEC 11179-30 — Basic attributes of metadata ... 2
4.4 ISO/IEC 11179-31 — Metamodel for data specification registration ... 2
4.5 ISO/IEC 11179-32 — Metamodel for concept system registration ... 2
5 Overview of the relationship between UML Class Diagrams and SQL ... **2**
6 Generating the SQL for the metamodel ... **3**
6.1 Overview ... 3
6.2 General principles for the translation of a UML Class diagram into SQL statements ... 3
6.3 Specific approaches taken for the translation of the metadata registry metamodel ... 4
6.3.1 Overview ... 4
6.3.2 Obligations ... 4
6.3.3 Translation of datatypes ... 5
6.3.4 Translation of the basic classes ... 6
6.3.5 Translation of the remaining classes ... 6
6.3.6 Translation of specialization hierarchies ... 6
6.3.7 Translation of the association classes ... 6
6.3.8 Translation of the attributes of the classes ... 6
6.3.9 Translation of the associations ... 7
6.3.10 Cross-table constraints ... 7
7 Example SQL for instantiation of the metamodel ... **7**
Annex A (informative) **Example SQL to instantiate the ISO/IEC 11179-3 metamodel** ... **8**
Annex B (informative) **Example SQL to instantiate the ISO/IEC 11179-32 metamodel** ... **23**
Annex C (informative) **Example SQL to instantiate the ISO/IEC 11179-31 metamodel** ... **28**
Bibliography ... **44**

© ISO/IEC 2025 – All rights reserved

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

ISO and IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO and IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO and IEC had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents and https://patents.iec.ch. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

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

This second edition cancels and replaces the first edition (ISO/IEC 19583-21:2022), which has been technically revised.

The main changes are as follows:

— examples have been added to instatiate the metamodel of the latest version of the ISO/IEC 11179 series (Annexes B and C have been added).

A list of all parts in the ISO/IEC 19583 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

© ISO/IEC 2025 – All rights reserved

Introduction

The ISO/IEC 11179 series[1] provides a specification for a registry in which information about metadata can be recorded and maintained.

The metamodel to instantiate such a registry is expressed in text as a conceptual model. This conceptual model is illustrated with a series of diagrams which use the class diagram notation from the Unified Modeling Language (UML).[2][3]

Implementers and users of the registries described in ISO/IEC 11179 require further guidance to turn the conceptual models into concrete instantiations. This document provides a possible instantiation of the registry metamodel specified in ISO/IEC 11179-3[4], ISO/IEC 11179-31[5] and ISO/IEC 11179-32[6] using the SQL database language as specified in the ISO/IEC 9075 series.[7]

This specimen instantiation is provided to increase the understanding of ISO/IEC 11179-3, ISO/IEC 11179-31 and ISO/IEC 11179-32, and hence, to promote its adoption.

This document is not intended to replace the UML version but rather serves as a complement, providing SQL statements that describe the ISO/IEC 11179 metamodel. It aims to facilitate the application of ISO/IEC 11179 in a database or related environment.

© ISO/IEC 2025 – All rights reserved

Information technology — Concepts and usage of metadata —

Part 21:
11179-3, -31, -32 Data model in SQL

1 Scope

This document provides a possible instantiation of the registry metamodel specified in ISO/IEC 11179-3, ISO/IEC 11179-31, ISO/IEC 11179-32 using the SQL database language as specified in ISO/IEC 9075-2.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

4 The relationship among ISO/IEC 11179-3, ISO/IEC 11179-31 and ISO/IEC 11179-32

4.1 Overview

The relationships among these parts are mutually dependent, and they collectively form a complete metadata registry system. ISO/IEC 11179-3 provides infrastructure support for the entire registry. ISO/IEC 11179-31 and ISO/IEC 11179-32 extend the functionality of the metadata registry by registering data specifications and concept systems, further enriching the metadata information stored in the registry. These parts work together to enable the metadata registry to effectively support data management and the discovery, understanding, and utilization of data assets.

4.2 ISO/IEC 11179-3 — Metamodel for registry common facilities

ISO/IEC 11179-3 specifies the core metamodel for a Metadata Registry (MDR), but it does so in a generic way, so that the resulting registry could be used to register anything, not just metadata.

The registry metamodel is not a complete description of all the metadata an organization might wish to record. Therefore, the model is designed to be extended if required. However, extensions are, by their nature, not part of ISO/IEC 11179-3.

Some extensions to the ISO/IEC 11179-3 metamodel are specified in other parts of ISO/IEC 11179, such as:

— ISO/IEC 11179-31: Metamodel for data specification registration;

— ISO/IEC 11179-32: Metamodel for concept system registration;

— ISO/IEC 11179-33: Metamodel for data set registration;

© ISO/IEC 2025 – All rights reserved