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Information technology — Common Logic (CL) — A framework for a family of logic-based languages

Technologies de l'information — Logique Commune (CL) — Cadre pour une famille des langages logique-basés

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Foreword

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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 ISO documents 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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO/IEC 24707:2007), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the list of syntactic errors that have already been identified in the Defect Report has been fixed;

— the XML syntax in Annex C has been corrected and completed;

— a more general approach to annotation of CL-texts has been made;

— semantics has been modified to allow the existence of definitional extensions in CL;

— support for circular imports;

— semantics of CL-module have been clarified;

— clarification of the distinction between segregated and non-segregated dialects;

— clarification of conformance conditions has been made.

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.

Introduction

Common Logic is a logic framework intended for information exchange and transmission. The framework allows for a variety of different syntactic forms, called dialects, all translatable by a semantics-preserving transformation to a common XML-based syntax.

Common Logic has some novel features, chief among them being a syntax which permits "higher-order" constructions, such as quantification over classes or relations while preserving a first-order model theory, and a semantics which allows theories to describe intentional entities such as classes or properties. It also has provision for the use of datatypes and for naming, importing and transmitting content on the World Wide Web using XML.

Information technology — Common Logic (CL) — A framework for a family of logic-based languages

1 Scope

This document specifies a family of logic languages designed for use in the representation and interchange of information and data among disparate computer systems.

The following features are essential to the design of this document.

— Languages in the family have declarative semantics. It is possible to understand the meaning of expressions in these languages without appeal to an interpreter for manipulating those expressions.

— Languages in the family are logically comprehensive – at its most general, they provide for the expression of arbitrary first-order logical sentences.

— Languages in the family are translatable by a semantics-preserving transformation to a common XML-based syntax, facilitating interchange of information among heterogeneous computer systems.

The following are within the scope of this document:

— representation of information in ontologies and knowledge bases;

— specification of expressions that are the input or output of inference engines;

— formal interpretations of the symbols in the language.

The following are outside the scope of this document:

— specification of proof theory or inference rules;

— specification of translators between the notations of heterogeneous computer systems;

— computer-based operational methods of providing relationships between symbols in the logical "universe of discourse" and individuals in the "real world".

This document describes Common Logic's syntax and semantics.

This document defines an abstract syntax and an associated model-theoretic semantics for a specific extension of first-order logic. The intent is that the content of any system using first-order logic can be represented in this document. The purpose is to facilitate interchange of first-order logic-based information between systems.

Issues relating to computability using this document (including efficiency, optimization, etc.) are not addressed.

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 2382:2015, *Information technology — Vocabulary*

ISO/IEC 10646:2014, *Information technology — Universal Coded Character Set (UCS)*

ISO/IEC 14977:1996, *Information technology — Syntactic metalanguage — Extended BNF*