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Information technology — Common Language Infrastructure (CLI) Partitions I to VI

Technologies de l'information — Infrastructure commune de langage (ICL) Partitions I à VI

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Common Language Infrastructure (CLI)

Partitions I–VI

Partition I: Concepts and Architecture
Partition II: Metadata Definition and Semantics
Partition III: CIL Instruction Set
Partition IV: Profiles and Libraries
Partition V: Debug Interchange Format
Partition VI: Annexes

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Common Language Infrastructure (CLI)

Partition I:
Concepts and Architecture

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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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 23271 was prepared by Ecma (as Ecma-335) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC. This second edition cancels and replaces the first edition (ISO/IEC 23271:2003), which has been technically revised.

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Information technology — Common Language Infrastructure (CLI) Partition I to VI

1 Scope

This International Standard defines the Common Language Infrastructure (CLI) in which applications written in multiple high-level languages can be executed in different system environments without the need to rewrite those applications to take into consideration the unique characteristics of those environments. This International Standard consists of the following parts:

- Partition I: Concepts and Architecture – Describes the overall architecture of the CLI, and provides the normative description of the Common Type System (CTS), the Virtual Execution System (VES) and the Common Language Specification (CLS). It also provides an informative description of the metadata.
- Partition II: Metadata Definition and Semantics – Provides the normative description of the metadata, its physical layout (as a file format), its logical contents (as a set of tables and their relationships) and its semantics (as seen from a hypothetical assembler, *ilasm*).
- Partition III: CIL Instruction Set – Describes the Common Intermediate Language (CIL) instruction set.
- Partition IV: Profiles and Libraries – Provides an overview of the CLI Libraries and a specification of their factoring into Profiles and Libraries. A companion file, CLILibrary.xml, considered to be part of this Partition, but distributed in XML format, provides details of each class, value type and interface in the CLI Libraries.
- Partition V: Debug Interchange Format.
- Partition VI: Annexes – Contains some sample programs written in CIL Assembly Language (ILAsm), information about a particular implementation of an assembler, a machine-readable description of the CIL instruction set which can be used to derive parts of the grammar used by this assembler, as well as other tools that manipulate CIL, a set of guidelines used in the design of the libraries of Partition IV and portability considerations.

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2 Conformance

A system claiming conformance to this International Standard shall implement all the normative requirements of this standard, and shall specify the profile (see Partition IV) that it implements. The minimal implementation is the Kernel Profile. A conforming implementation can also include additional functionality provided that functionality does not prevent running code written to rely solely on the profile as specified in this standard. For example, a conforming implementation can provide additional classes, new methods on existing classes, or a new interface on a standardized class, but it shall not add methods or properties to interfaces specified in this standard.

A compiler that generates Common Intermediate Language (CIL, see Partition III) and claims conformance to this International Standard shall produce output files in the format specified in this standard, and the CIL it generates shall be correct CIL as specified in this standard. Such a compiler can also claim that it generates *verifiable* code, in which case, the CIL it generates shall be verifiable as specified in this standard.

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3 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.

Extensible Markup Language (XML) 1.0 (Third Edition), 2004 February 4, http://www.w3.org/TR/2004/REC-xml-2004

Federal Information Processing Standard (FIPS 180-1*), Secure Hash Standard (SHA-1)*, 1995, April.

IEC 60559:1989, *Binary floating-point arithmetic for microprocessor systems* (previously designated IEC 559:1989)

ISO 639 (all parts), *Codes for the representation of names of languages*

ISO 3166 (all parts), *Codes for the representation of names of countries and their subdivision*

ISO/IEC 646:1991, *Information technology — ISO 7-bit coded character set for information interchange*

ISO/IEC 9899:1990, *Programming languages — C*

ISO/IEC 10646, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

ISO/IEC 11578:1996, *Information technology — Open Systems Interconnection — Remote Procedure Call (RPC)*

ISO/IEC 14882:2003, *Programming languages — C++*

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RFC-1764, *The PPP XNS IDP Control Protocol (XNSCP)*, Network Working Group, S. Senum, 1995, March

RFC-1766, *Tags for the Identification of Languages,* Network Working Group, H. Alvestrand, 1995, March

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RFC-2236, *Internet Group Management Protocol, Version 2,* Network Working Group, W. Fenner, 1997, November