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Part 1: Vocabulary and concepts

Ingénierie des systèmes et du logiciel — Assurance des systèmes et du logiciel —

Partie 1: Vocabulaire et concepts

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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.

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).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*, in cooperation with the Systems and Software Engineering Standards Committee of the IEEE Computer Society, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

This second edition cancels and replaces the first edition (ISO/IEC/IEEE 15026-1:2019), which has been technically revised.

The main changes are as follows:

— definitions of terms introduced in other parts of the ISO/IEC/IEEE 15026 series have been added or modified;

— definitions of terms whose definitions were sourced from ISO/IEC 15288 and ISO/IEC/IEEE 24774 have been updated.

A list of all parts in the ISO/IEC/IEEE 15026 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.

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Introduction

Software and systems assurance and closely related fields share concepts but have different vocabularies and perspectives. This document provides an unambiguous use of vocabulary for systems and software assurance and a unifying set of underlying concepts across these various fields. It provides a basis for elaboration, discussion and recording agreement and rationale regarding concepts and the vocabulary used uniformly across the ISO/IEC/IEEE 15026 series.

Clause 4 covers basic concepts such as assurance, stakeholders, systems and products, property, uncertainty and confidence, conditions and initial events, and consequence. Clause 5 covers some issues of which users of ISO/IEC/IEEE 15026-2, ISO/IEC/IEEE 15026-3 and ISO/IEC/IEEE 15026-4 should be initially aware (5.2). Clause 6, Clause 7 and Clause 8 cover concepts relevant to users of ISO/IEC/IEEE 15026-2, ISO/IEC/IEEE 15026-3 and ISO/IEC/IEEE 15026-4, respectively; also, users of one of these parts can benefit from the clauses for other parts.

The essential concepts introduced by the ISO/IEC/IEEE 15026 series are the claims in an assurance case and the support of claims in terms of argument and evidence. These claims are in the context of assurance for properties of systems and software within life cycle processes for the system or software product.

Potential users of the ISO/IEC/IEEE 15026 series are developers and maintainers of assurance cases and those who wish to develop, sustain, evaluate or acquire a system that possesses requirements for specific properties in such a way as to be more certain of those properties and their requirements. The ISO/IEC/IEEE 15026 series uses concepts and vocabulary consistent with ISO/IEC/IEEE 12207 and ISO/IEC/IEEE 15288 and generally consistent with the standards on Systems and software Quality Requirements and Evaluation (SQuaRE) developed by JTC 1/SC 7, but the concepts and vocabulary provided by the ISO/IEC/IEEE 15026 series can differ from those to which the potential user is accustomed. This document attempts to clarify these differences.

The ISO/IEC/IEEE 15026 series is made up of the following parts.

— ISO/IEC/IEEE 15026-1 explains concepts and terms as a basis for all parts of the ISO/IEC/IEEE 15026 series.

— ISO/IEC/IEEE 15026-2 includes requirements on the structure of the assurance case.

— ISO/IEC/IEEE 15026-3 relates integrity levels to the assurance case and includes requirements for their use with and without an assurance case.

— ISO/IEC/IEEE 15026-4 provides guidance and recommendations for assurance of a selected claim about the system-of-interest by achieving the claim and showing the achievement. The guidance and recommendations are given in a system assurance process view on top of ISO/IEC/IEEE 15288 and a software assurance process view on top of ISO/IEC/IEEE 12207.

The assurance case is relevant to a greater or lesser extent in all parts of the ISO/IEC/IEEE 15026 series, although ISO/IEC/IEEE 15026-4 discusses achieving the claim and showing the achievement of the claim whether or not such “showing” is contained in an artefact specifically called an “assurance case”.

ISO/IEC/IEEE 15026-2 concentrates on the contents and structure of the assurance case. ISO/IEC/IEEE 15026-3 relates integrity levels and assurance cases by describing how integrity levels and assurance cases can work together, especially in the definition of specifications for integrity levels or by using integrity levels within a portion of an assurance case. This relationship is governed by the degree of risk and dependencies in the system.

ISO/IEC/IEEE 15026-4 includes assurance-related guidance and recommendations for activities across the life cycle processes including activities that extend beyond those directly related to an assurance case, e.g. project planning for assurance-related considerations.

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Systems and software engineering — Systems and software assurance —

Part 1: Vocabulary and concepts

1 Scope

This document defines assurance-related terms and establishes an organized set of concepts to form a basis for shared understanding in the field of assurance. It benefits users of ISO/IEC/IEEE 15026-2, ISO/IEC/IEEE 15026-3 and ISO/IEC/IEEE 15026-4.

Vocabulary and concepts for assurance of a service being operated and managed on an ongoing basis is not covered in this document.

While essential to assurance practice, details regarding exactly how to measure, demonstrate or analyse particular properties are not covered.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO, IEC and IEEE 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/

— IEEE Standards Dictionary Online: available at https://ieeexplore.ieee.org/xpls/dictionary.jsp

NOTE For additional terms and definitions in the field of systems and software engineering, see ISO/IEC/IEEE 24765, which is published periodically as a "snapshot" of the SEVOCAB (Systems and software engineering vocabulary) database and is publicly accessible at https://www.computer.org/sevocab.

3.1 Terms related to assurance

3.1.1
assurance
grounds for justified confidence that a *claim* (3.1.10) has been or will be achieved

Note 1 to entry: By definition, assurance is about a claim.

Note 2 to entry: The claim can be a conjunction of more than one claim.

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