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Part 4: Assurance in the life cycle

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

Partie 4: Assurance du cycle de vie

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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 ISO documents should be noted. This document was drafted in accordance with the rules given in the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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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.

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 first edition cancels and replaces ISO/IEC 15026-4:2012, which has been technically revised.

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

— References to the life cycle processes standards (ISO/IEC 15288:2008 and ISO/IEC 12207:2008, respectively) are changed to refer to their updated versions (ISO/IEC/IEEE 15288:2015 and ISO/IEC/IEEE 12207:2017, respectively).

— Outcomes of the process views are changed to make the link to their purpose clearer.

A list of all parts in the ISO/IEC 15026 series can be found on the ISO website.

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.

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Introduction

Many specialized standards and guidelines address specific application areas and topics related to assurance and use different concepts and terminology when addressing common themes. ISO/IEC/IEEE 15026-1 provides terminology and concepts used in ISO/IEC 15026 (all parts).

ISO/IEC 15026-2 provides minimum requirements for the structure and contents of assurance cases that treat claims regarding properties of a system or software product selected for special treatment. The results of performing the life cycle activities and tasks referenced in this document can be recorded in the form of the assurance case described in ISO/IEC 15026-2.

ISO/IEC 15026-3 specifies the concept of integrity levels with corresponding integrity level requirements that are required to be met in order to show the achievement of the integrity level.

ISO/IEC 15026-2, ISO/IEC 15026-3 and this document all use the concepts and vocabulary defined in ISO/IEC/IEEE 15026-1; however, any part may be applied independently of the others and the use of one does not require the use of any others.

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Systems and software engineering — Systems and software assurance —

Part 4: Assurance in the life cycle

1 Scope

This document 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.

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/IEEE 15026-1, *Systems and software engineering — Systems and software assurance — Part 1: Concepts and vocabulary*

ISO/IEC/IEEE 15288, *Systems and software engineering — System life cycle processes*

ISO/IEC/IEEE 12207, *Systems and software engineering — Software life cycle processes*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC/IEEE 15026-1, ISO/IEC/IEEE 15288, and ISO/IEC/IEEE 12207 and the following apply.

ISO, IEC and IEEE maintain terminological databases for use in standardization at the following addresses:

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

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

— IEEE Standards Dictionary Online: available at http://dictionary.ieee.org/

3.1
assurance
grounds for justified confidence that a claim 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.

[SOURCE: ISO/IEC/IEEE 15026-1:2019, 3.1.1, modified — Notes 1 and 2 to entry have been added.]

3.2
assurance argument
artefact that links tangible evidence and assumptions to provide a convincing and valid argument of a claim under a given context

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3.3
assurance claim
claim for which *assurance* (3.1) is considered

3.4
assurance information
information including a claim about a system, evidence supporting the claim, an argument showing how the evidence supports the achievement of the claim, and the context for these items

Note 1 to entry: The sub-claims included in the argument of assurance information can be about the life cycle of the system of interest when, for example, the top-level claim implies continuous achievement of some property.

Note 2 to entry: ISO/IEC 15026-2 specifies assurance cases that documents assurance information.

3.5
assurance objective
purpose of achievement of the *assurance claim* (3.3)

Note 1 to entry: Assurance objectives determine the required degree of integrity level and permissible uncertainty in the *assurance information* (3.4).

3.6
critical property
property that is agreed by primary stakeholders as having serious consequence

4 Conformance

The assurance guidance and recommendations referenced in this document are to be understood in the context of the processes, activities and tasks of ISO/IEC/IEEE 15288 and ISO/IEC/IEEE 12207.

Conformance may be claimed to this document with respect to the system assurance process view and/or the software assurance process view. Thus, conformance to this document shall be achieved in either or both of the following ways.

a) achieving the required outcomes of the system assurance process view, in addition to conforming to ISO/IEC/IEEE 15288;

b) achieving the required outcomes of the software assurance process view, in addition to conforming to ISO/IEC/IEEE 12207.

5 Key concepts

5.1 Process view

It is presumed that the user of this document is using a defined life cycle model. This document provides two process views: the system assurance process view on top of ISO/IEC/IEEE 15288 and the software assurance process view on top of ISO/IEC/IEEE 12207.

NOTE See ISO/IEC/IEEE 15288 or ISO/IEC/IEEE 12207 for a description and examples of process views.

According to the description in ISO/IEC/IEEE 15288 and ISO/IEC/IEEE 12207, a process view includes

— name,

— purpose,

— outcomes, and

— identification and description of the processes, activities and tasks that implement the process view, and references to the sources for these processes, activities and tasks in other standards.

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