

IEEE Standard Adoption of ISO/IEC 15026-4—Systems and Software Engineering—Systems and Software Assurance—Part 4: Assurance in the Life Cycle

IEEE Computer Society

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IEEE Standard Adoption of ISO/IEC 15026-4—Systems and Software Engineering—Systems and Software Assurance—Part 4: Assurance in the Life Cycle

Sponsor

Software & Systems Engineering Standards Committee
of the
IEEE Computer Society

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IEEE-SA Standards Board

Abstract: Guidance and recommendations for conducting selected processes, activities, and tasks for systems and software products requiring assurance claims for properties selected for special attention (called critical properties) are given in this adoption of ISO/IEC 15026-4:2012. IEEE Std 15026-4™-2013 specifies a property-independent list of processes, activities and tasks to achieve the claim and show the achievement of the claim. IEEE Std 15026-4-2013 establishes the processes, activities, tasks, guidance, and recommendations in the context of a defined life cycle model and set of life cycle processes for system and/or software life cycle management.

Keywords: adoption, argument, assurance case, claim, dependability, evidence, IEEE 15026-4™, integrity level, property, reliability, safety, security, software assurance, software engineering, system assurance, systems engineering

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James W. Moore, *IEEE Computer Society Liaison to ISO/IEC JTC 1/SC7*

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Introduction

This introduction is not part of IEEE Std 15026-4™-2013, IEEE Standard Adoption of ISO/IEC 15026-4, Systems and Software Engineering—Systems and Software Assurance—Part 4: Assurance in the Life Cycle.

The IEEE Software and Systems Engineering Standards Committee (S2ESC) has undertaken a long-term program to harmonize its standards with those of ISO/IEC JTC 1/SC 7, the international standards committee for software and systems engineering. In areas of overlap, one organization sometimes adopts the relevant standard from the other organization, or the two organizations cooperate to produce a single joint standard. In this case, S2ESC has chosen to adopt a relevant document from SC 7.

This IEEE standard is an adoption of ISO/IEC 15026-4:2012. References to some ISO/IEC standards should be considered as references to the identical IEEE standard:

- ISO/IEC/IEEE 12207:2008 is identical to ISO/IEC 12207:2008
- ISO/IEC/IEEE 15288:2008 is identical to ISO/IEC 15288:2008
- ISO/IEC/IEEE 15289:2011 is identical to ISO/IEC 15288:2011
- ISO/IEC/IEEE 16085:2006 is identical to ISO/IEC 16085:2006
- ISO/IEC/IEEE 29148:2011 is identical to ISO/IEC 29148:2011
- ISO/IEC/IEEE 42010:2011 is identical to ISO/IEC 42010:2011
- IEEE Std 15026-1™-2011 is identical to ISO/IEC TR 15026-1:2010
- IEEE Std 15026-2™-2011 is identical to ISO/IEC 15026-2:2011
- IEEE Std 15026-3™-2011 is identical to ISO/IEC 15026-3:2011
- IEEE Std 15939:20xx is identical to ISO/IEC 15939:2007
- IEEE Std 24748-1™:2010 is identical to ISO/IEC 24748-1:2010
- IEEE Std 24748-2™:2011 is identical to ISO/IEC 24748-2:2011
- IEEE Std 24748-3™:2011 is identical to ISO/IEC 24748-3:2011
- IEEE Std 90003™:2008 is identical to ISO/IEC 90003:2004

Errata

The following editorial corrections are made in the adopted document:

Page 5, 7.2.2: Add a closing parenthesis before the period appearing in the fourth line.

Page 6, 7.3.1: Change the column headings of the table to read “Activities from 15288” and “Activities from 12207”.

Page 15, 7.9.1: Change “form” to “from” in the left-hand column heading.

Page 22, 7.13.2: Change “assurance=claim=related” to “assurance-claim-related” in the fifth line.

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**Systems and software engineering —
Systems and software assurance —**

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. 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 shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 15026-4 was prepared by Joint Technical Committee ISO/TC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

ISO/IEC 15026 consists of the following parts, under the general title *Systems and software engineering — Systems and software assurance*:

- *Part 1: Concepts and vocabulary* [Technical Report]
- *Part 2: Assurance case*
- *Part 3: System integrity levels*
- *Part 4: Assurance in the life cycle*

Introduction

In its entirety, ISO/IEC 15026 consists of multiple parts:

- a) ISO/IEC TR 15026-1, *System and software engineering — Systems and software assurance — Part 1: Concepts and vocabulary*

NOTE ISO/IEC TR 15026-1 is intended to be replaced by an International Standard.

- b) ISO/IEC 15026-2, *System and software engineering — Systems and software assurance — Part 2: Assurance case*
- c) ISO/IEC 15026-3, *System and software engineering — Systems and software assurance — Part 3: System integrity levels*
- d) ISO/IEC 15026-4, *System and software engineering — Systems and software assurance — Part 4: Assurance in the life cycle*

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 TR 15026-1 provides terminology and concepts used in all parts of ISO/IEC 15026.

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 part of ISO/IEC 15026 can be recorded in the form of the assurance case described in ISO/IEC 15026-2.

ISO/IEC 15026-3 addresses the assignment of integrity levels for selected elements of a system. Where ISO/IEC 15026-2 is applicable, it can bring useful structure, aid, and direction to defining claims and showing their achievement through the use of integrity levels and accompanying integrity level requirements.

ISO/IEC 15026-2, ISO/IEC 15026-3 and ISO/IEC 15026-4 all use the concepts and vocabulary defined in ISO/IEC TR 15026-1; however, any part can be applied independently of the others and the use of one does not require the use of any others.

Systems and software engineering — Systems and software assurance —

Part 4: Assurance in the life cycle

1 Scope

This part of ISO/IEC 15026 gives guidance and recommendations for conducting selected processes, activities and tasks for systems and software products requiring assurance claims for properties selected for special attention, called critical properties. This part of ISO/IEC 15026 specifies a property-independent list of processes, activities and tasks to achieve the claim and show the achievement of the claim. This part of ISO/IEC 15026 establishes the processes, activities, tasks, guidance and recommendations in the context of a defined life cycle model and set of life cycle processes for system and/or software life cycle management.

NOTE The stakeholders determine which of the system or software properties are selected for special attention and require assurance claims. This part of ISO/IEC 15026 uses the term “critical” to distinguish those properties from other requirements.

2 Conformance

Conformance may be claimed to this part of ISO/IEC 15026 with respect to the systems assurance process view and/or the software assurance process view. Thus, conformance to this part of ISO/IEC 15026 can be achieved in either or both of the following ways:

- a) Demonstrating that the required outcomes of the systems assurance process view (6.1.2) have been achieved, in addition to conforming to the Agreement, Project, and Technical processes of ISO/IEC 15288.
- b) Demonstrating that the required outcomes of the software assurance process view (6.2.2) have been achieved, in addition to conforming to the Agreement, Project, Technical, and Software Specific processes of ISO/IEC 12207:2008.

A claim of conformance is relevant only to specific claims regarding designated systems or software.

Conformance to ISO/IEC 15026 Part 2 can assist in achieving the outcomes required by the two process views in this part of ISO/IEC 15026.

NOTE Parties to an agreement may choose to incorporate selected portions of this part of the International Standard into the terms of the agreement. However, compliance with the agreement does not justify a claim of conformance to this part of the International Standard. A claim of conformance can only be justified as explained above.

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 documents (including any amendments) applies.

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