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

**Part 1:
Concepts and vocabulary**

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

Partie 1: Concepts et vocabulaire

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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

This first edition of ISO/IEC 15026-1 cancels and replaces ISO/IEC TR 15026-1:2010, which has been technically revised.

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*
- *Part 2: Assurance case*
- *Part 3: System integrity levels*
- *Part 4: Assurance in the life cycle*

The IEEE Computer Society collaborated with ISO/IEC JTC 1 in the development of the international standards of ISO/IEC 15026. *IEEE Std 1228-1994* and *IEEE Standard for Safety Plan* were used as base documents in the development of this standard.

Introduction

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

This part of ISO/IEC 15026 clarifies concepts needed for understanding software and systems assurance and, in particular, those central to the use of ISO/IEC 15026-2 to ISO/IEC 15026-4. It supports shared concepts, issues and terminology applicable across a range of properties, application domains, and technologies.

Systems and software engineering — Systems and software assurance —

Part 1: Concepts and vocabulary

1 Scope

This part of ISO/IEC 15026 defines assurance-related terms and establishes an organized set of concepts and relationships to establish a basis for shared understanding across user communities for assurance. It provides information to users of the other parts of ISO/IEC 15026 including the combined use of multiple parts. The essential concept introduced by ISO/IEC 15026 is the statement of *claims* in an *assurance case* and the support of those claims through *argumentation* 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.

Assurance for a service being operated and managed on an ongoing basis is not covered in ISO/IEC 15026.

2 Applicability

2.1 Audience

A variety of potential users of ISO/IEC 15026 exists including 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. ISO/IEC 15026 uses concepts and terms consistent with ISO/IEC 12207 and ISO/IEC 15288 and generally consistent with the ISO/IEC 25000 series, but the potential users of ISO/IEC 15026 need to understand differences from concepts and terms to which they may be accustomed. This part of ISO/IEC 15026 attempts to clarify these differences.

2.2 Field of applicability

The primary purpose of this part of ISO/IEC 15026 is to aid users of the other parts of ISO/IEC 15026 by providing context, concepts, and explanations for assurance, assurance cases, and integrity levels. While essential to assurance practice, details regarding exactly how to measure, demonstrate, or analyse particular properties are not covered. These are the subjects of more specialized standards of which a number are referenced and included in the Bibliography.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE These are intended to be uniform through all parts of ISO/IEC 15026.

3.1 Terms related to assurance and properties

3.1.1

assurance

grounds for justified confidence that a claim has been or will be achieved