

First edition  
2011-12-01

---

---

## **Systems and software engineering — Architecture description**

*Ingénierie des systèmes et des logiciels — Description de l'architecture*



Reference number  
ISO/IEC/IEEE 42010:2011(E)

© ISO/IEC 2011  
© IEEE 2011



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2011  
© IEEE 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO or IEEE at the respective address below.

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](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Institute of Electrical and Electronics Engineers, Inc.  
3 Park Avenue, New York • NY 10016-5997, USA  
E-mail [stds.ipr@ieee.org](mailto:stds.ipr@ieee.org)  
Web [www.ieee.org](http://www.ieee.org)

Published in Switzerland

This is a preview of "ISO/IEC/IEEE 42010:2...". Click here to purchase the full version from the ANSI store.

## Contents

Page

<b>Foreword .....</b>	<b>iv</b>
<b>Introduction.....</b>	<b>v</b>
<b>1 Scope .....</b>	<b>1</b>
<b>2 Conformance .....</b>	<b>1</b>
<b>3 Terms and definitions .....</b>	<b>1</b>
<b>4 Conceptual foundations .....</b>	<b>3</b>
4.1 Introduction.....	3
4.2 Conceptual model of architecture description.....	3
4.3 Architecting in the life cycle.....	8
4.4 Uses of architecture descriptions .....	8
4.5 Architecture frameworks and architecture description languages .....	9
<b>5 Architecture descriptions.....</b>	<b>11</b>
5.1 Introduction.....	11
5.2 Architecture description identification and overview .....	12
5.3 Identification of stakeholders and concerns.....	12
5.4 Architecture viewpoints.....	13
5.5 Architecture views.....	13
5.6 Architecture models.....	13
5.7 Architecture relations .....	14
5.8 Architecture rationale .....	15
<b>6 Architecture frameworks and architecture description languages .....</b>	<b>16</b>
6.1 Architecture frameworks .....	16
6.2 Adherence of an architecture description to an architecture framework .....	17
6.3 Architecture description languages .....	17
<b>7 Architecture viewpoints.....</b>	<b>17</b>
<b>Annex A (informative) Notes on terms and concepts .....</b>	<b>19</b>
<b>Annex B (informative) Guide to architecture viewpoints.....</b>	<b>27</b>
<b>Annex C (informative) Relationship to other standards .....</b>	<b>31</b>
<b>Bibliography.....</b>	<b>35</b>

## 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.

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information contained in its standards.

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

The main task of ISO/IEC JTC 1 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 called to the possibility that implementation of this standard may require the use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. ISO/IEEE is not responsible for identifying essential patents or patent claims for which a license may be required, for conducting inquiries into the legal validity or scope of patents or patent claims or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance or a Patent Statement and Licensing Declaration Form, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from ISO or the IEEE Standards Association.

ISO/IEC/IEEE 42010 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*, in cooperation with the Software and Systems Engineering Standards Committee of the Computer Society of the IEEE, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

This first edition of ISO/IEC/IEEE 42010 cancels and replaces ISO/IEC 42010:2007, which has been technically revised.

This is a preview of "ISO/IEC/IEEE 42010:2...". [Click here to purchase the full version from the ANSI store.](#)

## Introduction

The complexity of man-made systems has grown to an unprecedented level. This has led to new opportunities, but also to increased challenges for the organizations that create and utilize systems. Concepts, principles and procedures of architecting are increasingly applied to help manage the complexity faced by stakeholders of systems.

Conceptualization of a system's architecture, as expressed in an architecture description, assists the understanding of the system's essence and key properties pertaining to its behaviour, composition and evolution, which in turn affect concerns such as the feasibility, utility and maintainability of the system.

Architecture descriptions are used by the parties that create, utilize and manage modern systems to improve communication and co-operation, enabling them to work in an integrated, coherent fashion. Architecture frameworks and architecture description languages are being created as assets that codify the conventions and common practices of architecting and the description of architectures within different communities and domains of application.

This International Standard addresses the creation, analysis and sustainment of architectures of systems through the use of architecture descriptions.

This International Standard provides a core ontology for the description of architectures. The provisions of this International Standard serve to enforce desired properties of architecture descriptions. This International Standard also specifies provisions that enforce desired properties of architecture frameworks and architecture description languages (ADLs), in order to usefully support the development and use of architecture descriptions. This International Standard provides a basis on which to compare and integrate architecture frameworks and ADLs by providing a common ontology for specifying their contents.

This International Standard can be used to establish a coherent practice for developing architecture descriptions, architecture frameworks and architecture description languages within the context of a life cycle and its processes (not defined by this International Standard). This International Standard can further be used to assess conformance of an architecture description, of an architecture framework, of an architecture description language, or of an architecture viewpoint to its provisions.

Users of this International Standard are advised to consult Clause 4 to gain appreciation of the provided ontology, its concepts and principles.