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Software and systems engineering — Software testing

Part 2: Test processes

National foreword

This British Standard is the UK implementation of ISO/IEC/IEEE 29119-2:2021. It supersedes BS ISO/IEC/IEEE 29119-2:2013, which is withdrawn.

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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/IEC 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 or www.iec.ch/members_experts/refdocs).

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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. In the IEC, see www.iec.ch/understanding-standards.

ISO/IEC/IEEE 29119-2 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 29119-2:2013), which has been technically revised.

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

— The definition of the test design and implementation process (8.2) has been updated. In the first edition, this process was based on the use of test conditions. Feedback on use of the standard highlighted a problem with users' understanding of 'test conditions' and their use for deriving test cases. This second edition has replaced the use of 'test conditions' with 'test models'. Annex E provides more detail on this change.

A list of all parts in the ISO/IEC/IEEE 29119 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

The purpose of this document is to define a generic process model for software testing that can be used by any organization when performing any form of software testing. It comprises test process descriptions that define the software testing processes at the organizational level, test management level and dynamic test levels. Supporting informative diagrams describing the processes are also provided. ISO/IEC/IEEE 29119 (all parts) supports dynamic testing, functional and non-functional testing, manual and automated testing, and scripted and unscripted testing. The processes defined in this document can be used in conjunction with any software development lifecycle model. Each process is defined using the generic process template that is provided in ISO/IEC TR 24774, and covers the purpose, outcomes, activities, tasks and information items of each test process.

Testing is a key approach to risk treatment in software development. This document follows a risk-based approach to testing. Risk-based testing is a best-practice approach to strategizing and managing testing, as it allows testing to be prioritized and focused on the most important features and quality attributes.

This document uses the traditional concept of organizations and projects, but some organizations, especially those using an agile approach, do not organize their development in terms of projects; instead, they run product development based on more long-lasting product teams. Users of this document can substitute the term ‘product’ for ‘project’ where appropriate.

The concepts that support ISO/IEC/IEEE 29119 (all parts) are defined in ISO/IEC/IEEE 29119-1. Templates and examples of test documentation that are produced during the testing process are defined in ISO/IEC/IEEE 29119-3. Software test design techniques that can be used during testing are defined in ISO/IEC/IEEE 29119-4.

ISO/IEC/IEEE 29119 (all parts) aims to provide those responsible for software testing with the information required to manage and perform software testing in any organization.

Users of ISO/IEC/IEEE 12207 perform several activities and tasks which are related to software testing. Annex B provides a mapping for such users between the clauses and subclauses of ISO/IEC/IEEE 12207 and the clauses and subclauses of this document.

Users of ISO/IEC 17025 perform several activities and tasks which are related to software testing. Annex C provides a mapping for such users between the clauses and subclauses of ISO/IEC 17025 and the clauses and subclauses of this document.

Users of BS 7925-2 perform several activities and tasks which are related to software component testing. Annex D provides a mapping for such users between the clauses and subclauses of BS 7925-2 and the clauses and subclauses of this document.

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INTERNATIONAL STANDARD **ISO/IEC/IEEE 29119-2:2021**

Software and systems engineering — Software testing —

Part 2: Test processes

1 Scope

This document specifies test processes that can be used to govern, manage and implement software testing for any organization, project or testing activity. It comprises generic test process descriptions that define the software testing processes. Supporting informative diagrams describing the processes are also provided.

This document is applicable to testing in all software development lifecycle models.

This document is intended for, but not limited to, testers, test managers, developers and project managers, particularly those responsible for governing, managing and implementing software testing.

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 12207, *Systems and software engineering — Software life cycle processes*

3 Terms and definitions

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

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
actual results
set of behaviours or conditions of a *test item* (3.42), or set of conditions of associated data or the *test environment* (3.34), observed as a result of *test execution* (3.38)

EXAMPLE Outputs to screen, outputs to hardware, changes to data, reports and communication messages sent.

3.2
completion criteria
conditions under which the *testing* (3.61) activities are considered complete

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