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Second edition
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Software and systems engineering — Software testing —

Part 4: Test techniques

Ingénierie du logiciel et des systèmes — Essais du logiciel —

Partie 4: Techniques d'essai

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ISO/IEC/IEEE 29119-4 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 29119-4:2015), which has been technically revised.

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

— The test techniques in this document are defined using a new form of the test design and implementation process from ISO/IEC/IEEE 29119-2. In the first version, this process was based on the use of test conditions. Feedback on use of the previous edition 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 H provides more detail on this change and the Introduction describes the new process.

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 provide an International Standard that defines software test design techniques (also known as test case design techniques or test methods) that can be used within the test design and implementation process that is defined in ISO/IEC/IEEE 29119-2. This document does not describe a process for test design and implementation. The intent is to describe a series of techniques that have wide acceptance in the software testing industry. This document is originally based on the British standard, BS 7925-2. Annex G provides a mapping from the requirements of BS 7925-2 to the clauses and subclauses of this document.

The test design techniques presented in this document can be used to derive test cases that, when executed, generate evidence that test item requirements have been met or that defects are present in a test item (i.e. that requirements have not been met). Risk-based testing can be used to determine the set of techniques that are applicable in specific situations (risk-based testing is covered in ISO/IEC/IEEE 29119-1 and ISO/IEC/IEEE 29119-2).

NOTE   A "test item" is a work product that is being tested (see ISO/IEC/IEEE 29119-1).

EXAMPLE 1   "Test items" include systems, software items, objects, classes, requirements documents, design specifications, and user guides.

Each technique follows the test design and implementation process that is defined in ISO/IEC/IEEE 29119-2 and shown in Figure 1.

Of the activities in this process, this document provides guidance on how to implement the following activities in detail for each technique that is described:

— create test model (TD1);

— identify test coverage items (TD2);

— derive test cases (TD3).

A test model represents testable aspects of a test item, such as a function, transaction, feature, quality attribute, or structural element identified as a basis for testing. The test model reflects the required test completion criterion in the test strategy.

EXAMPLE 2   If a test completion criterion for state transition testing was identified that required coverage of all states then the test model would show the states the test item can be in.

Test coverage items are attributes of the test model that can be covered during testing. A single test model will typically be the basis for several test coverage items.

A test case is a set of preconditions, inputs (including actions, where applicable), and expected results, developed to determine whether or not the covered part of the test item has been implemented correctly.

Specific (normative) guidance on how to implement the create test procedures activity (TD4) in the test design and implementation process of ISO/IEC/IEEE 29119-2 is not included in Clauses 5 or 6 because the process is the same for all techniques.