



Technical Specification

ISO/IEC TS 25052-2

Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE): cloud services —

Part 2: Quality measurement

*Ingénierie des systèmes et du logiciel — Exigences de qualité
et évaluation des systèmes et du logiciel (SQuaRE): services
en nuage —*

Partie 2: Mesure de la qualité

**First edition
2024-12**

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/IEC TS 25052-2:2024](https://standards.iteh.ai/catalog/standards/iso/21b31952-5add-437a-b82c-4eb396becea5/iso-iec-ts-25052-2-2024)

<https://standards.iteh.ai/catalog/standards/iso/21b31952-5add-437a-b82c-4eb396becea5/iso-iec-ts-25052-2-2024>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Format used for documenting the quality measures	2
5 Cloud service quality measures	2
5.1 Overview.....	2
5.2 Service performance efficiency measures.....	3
5.2.1 General.....	3
5.2.2 Time behaviour measures.....	3
5.2.3 Aggregated resource utilization measures.....	3
5.2.4 Capacity measures.....	3
5.2.5 Scalability measures.....	4
5.2.6 Elasticity measures.....	4
5.3 Service compatibility measures.....	5
5.3.1 General.....	5
5.3.2 Cloud interoperability measures.....	5
5.4 Service usability measures.....	5
5.4.1 General.....	5
5.4.2 Accessibility measures.....	6
5.5 Service reliability measures.....	6
5.5.1 General.....	6
5.5.2 Availability measures.....	6
5.5.3 Resilience measures.....	6
5.5.4 Recoverability measures.....	7
5.6 Service security measures.....	7
5.6.1 General.....	7
5.6.2 Confidentiality measures.....	7
5.6.3 Accountability measures.....	8
5.6.4 Isolation measures.....	8
5.6.5 PII protection conformance measures.....	9
5.6.6 Security responsibility measures.....	9
5.6.7 Asset protection measures.....	9
5.7 Service maintainability measures.....	10
5.7.1 General.....	10
5.7.2 Maintenance compliance and versioning measures.....	10
5.7.3 Reversibility measures.....	10
5.7.4 Monitorability measures.....	11
5.8 Portability measures.....	11
5.8.1 General.....	11
5.8.2 Cloud data portability measures.....	11
5.8.3 Cloud application portability measures.....	12
5.9 Service provisionability measures.....	13
5.9.1 General.....	13
5.9.2 Service measurability measures.....	13
5.9.3 Auditability measures.....	14
5.9.4 Governability measures.....	14
5.9.5 Self-provisioning measures.....	15
5.9.6 SLA (service level agreement) information completeness measures.....	15
5.9.7 SLA (service level agreement) satisfaction measures.....	15
5.10 Service responsiveness measures.....	16
5.10.1 General.....	16

ISO/IEC TS 25052-2:2024(en)

5.10.2	Service supportiveness measures	16
5.10.3	Reactiveness measures	16
5.10.4	Continuity measures	16
Bibliography	18

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ISO/IEC TS 25052-2:2024](https://standards.iteh.ai/catalog/standards/iso/21b31952-5add-437a-b82c-4eb396becea5/iso-iec-ts-25052-2-2024)

<https://standards.iteh.ai/catalog/standards/iso/21b31952-5add-437a-b82c-4eb396becea5/iso-iec-ts-25052-2-2024>

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 document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

ISO and IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO and IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO and IEC had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents and <https://patents.iec.ch>. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

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

A list of all parts in the ISO/IEC 25052 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.

Introduction

In the standards on SQuaRE developed by ISO/IEC JTC 1/SC 7, there are well-defined quality models for measuring and evaluating system and software products, IT services, data, etc. Although the standards on SQuaRE developed by ISO/IEC JTC 1/SC 7 provide practical quality models, they do not fit new technologies well. To support the evaluation of new technologies, ISO/IEC TS 25052-1 defines the quality model of cloud services, which is an extension of the quality models defined in ISO/IEC 25010 to ISO/IEC 25019. To support the practical measurement of cloud services, this document provides quality measures based on the quality model defined in ISO/IEC TS 25052-1.

Compared to information and communication technology (ICT) systems, cloud computing has different characteristics. This document reflects the characteristics of cloud computing. The following are the key characteristics of cloud computing described in ISO/IEC 22123-2.

- Broad network access: physical and virtual resources are available over a network and accessed through standard mechanisms that promote the use of cloud service customers (CSC).
- Measured service: characteristic in which the metered delivery of cloud services is such that usage can be monitored, controlled, reported, and billed.
- Multi-tenancy: characteristic in which physical or virtual resources are allocated in such a way that multiple tenants and their computations and data are isolated from and inaccessible to one another.
- On-demand self-service: characteristic in which a CSC can provision cloud services, as needed, automatically or with minimal interaction with cloud service providers(CSP).
- Rapid elasticity and scalability: resources can be rapidly and elastically adjusted, in some cases automatically, to quickly increase or decrease capacity.
- Resource pooling: characteristic in which a CSP's physical or virtual resources can be aggregated to serve one or more CSCs.

The quality model in this document is to support the non-functional specification and evaluation of cloud services from different perspectives by those associated with cloud service selection, requirements analysis, development, use, evaluation, support, maintenance, quality assurance and control, and audit.

For example, activities during cloud service selection that can benefit from the use of the quality model include:

- identifying cloud services requirements;
- establishing cloud service selection criteria;
- defining service coverage and service objectives;
- establishing service level agreements;
- establishing measures of quality characteristics in support of these activities.

Activities during cloud service development that can benefit from the use of the quality model include:

- identifying cloud service requirements;
- validating comprehensiveness of requirement definitions;
- identifying cloud service design objectives;
- identifying cloud service testing objectives;
- identifying quality control criteria as part of quality assurance;
- identifying acceptance criteria for a cloud service;

- establishing measures of quality characteristics in support of these activities.

Figure 1 illustrates the organization of the standards on SQuaRE developed by ISO/IEC JTC 1/SC 7. Similar standards are grouped into divisions. Each division provides guidance and resources for performing a different function in ensuring system and software product quality. This document belongs to extension division 25050 to 25099.

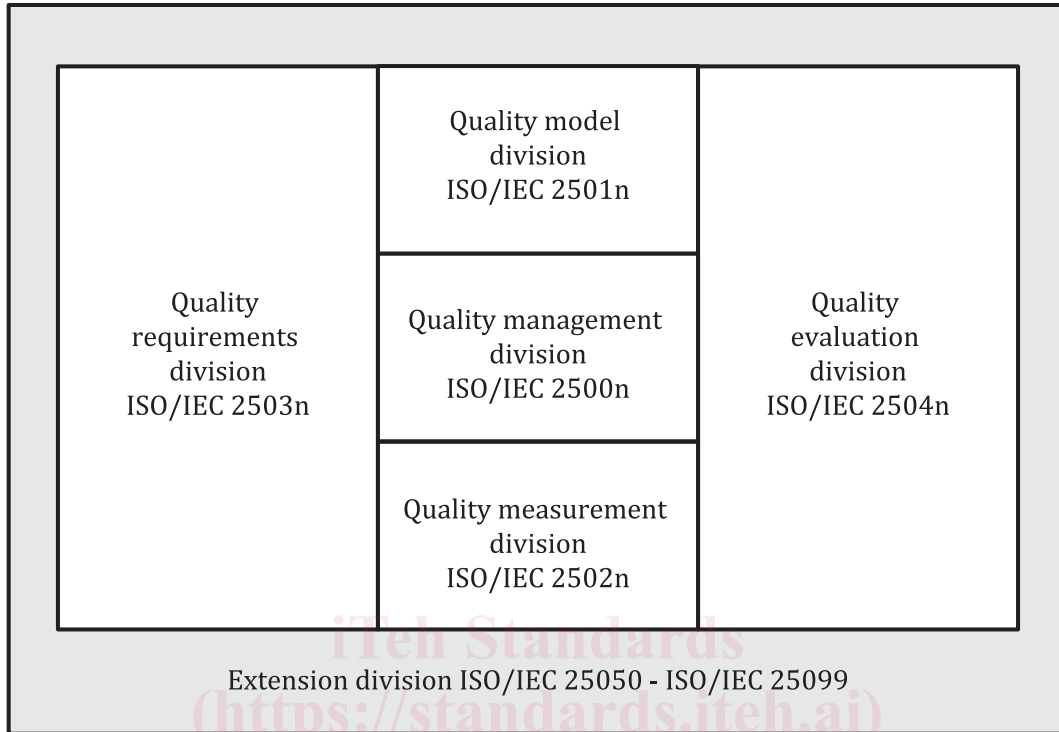


Figure 1 — Organization of the standards on SQuaRE developed by ISO/IEC JTC 1/SC 7

The divisions within standards on SQuaRE are:

- ISO/IEC 25000 to ISO/IEC 25009 - Quality management division. The International Standards that form this division define all common models, terms, and definitions referred to by all other standards on SQuaRE developed by ISO/IEC JTC 1/SC 7. This division also provides requirements and guidance for a supporting function that is responsible for the management of the requirements, specification, and evaluation of software product quality. Practical guidance on the use of the quality models is also provided.
- ISO/IEC 25010 to ISO/IEC 25019 - Quality model division. The International Standards that form this division present detailed quality models for computer systems and software products, data, IT services, and quality-in-use.
- ISO/IEC 25020 to ISO/IEC 25029 - Quality measurement division. The International Standards that form this division include a quality measurement framework, mathematical definitions of quality measures, and practical guidance for their application. Examples are given of quality measures for the internal and external properties of products, data, IT services, and quality-in-use. Quality measure elements (QME) forming foundations for quality measures for the internal and external properties of products are defined and presented.
- ISO/IEC 25030 to ISO/IEC 25039- Quality requirements division. The International Standards that form this division help specify quality requirements based on quality models and quality measures. These quality requirements can be used in the process of eliciting quality requirements for information systems and IT services to be developed or as input for an evaluation process.
- ISO/IEC 25040 to ISO/IEC 25049 - Quality evaluation division. The International Standards that form this division provide requirements, recommendations, and guidelines for software product evaluation,

ISO/IEC TS 25052-2:2024(en)

whether performed by evaluators, acquirers, or developers. The guideline for documenting a measure as an evaluation module is also provided.

- ISO/IEC 25050 to ISO/IEC 25099 - SQuaRE extension division. These International Standards currently include requirements for quality of ready-to-use software product (RUSP), Common Industry Formats for usability reports, and quality models and measures for new technologies such as cloud services and artificial intelligence.

iTeh Standards (<https://standards.itih.ai>) Document Preview

[ISO/IEC TS 25052-2:2024](https://standards.itih.ai/catalog/standards/iso/21b31952-5add-437a-b82c-4eb396becea5/iso-iec-ts-25052-2-2024)

<https://standards.itih.ai/catalog/standards/iso/21b31952-5add-437a-b82c-4eb396becea5/iso-iec-ts-25052-2-2024>

Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE): cloud services —

Part 2: Quality measurement

1 Scope

This document defines quality measures for quantitatively evaluating cloud services quality in terms of characteristics and sub-characteristics defined in ISO/IEC TS 25052-1 and is intended to be used together with ISO/IEC TS 25052-1.

This document contains the following:

- a basic set of quality measures for each characteristic and sub-characteristics;
- an explanation of how to apply quality measures to cloud services.

Since the quality model defined in ISO/IEC TS 25052-1 is the extension to the existing quality models defined in ISO/IEC 25010 to ISO/IEC 25019, it can be used with the product quality model, IT service quality model, data quality model, and quality-in-use model according to evaluation purposes. For the same reason, the quality measures defined in this document can also be used with the quality measures for software ICT products, IT services, data, and quality-in-use.

As there are several cloud service categories, this document focuses on the quality model of SaaS (software as a service). This document does not address PaaS (platform as a service) and IaaS (infrastructure as a service).

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 25000, *Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Guide to SQuaRE*

ISO/IEC 22123-1, *Information technology — Cloud computing — Part 1: Vocabulary*

3 Terms and definitions

For this document, the terms and definitions given in ISO/IEC 25000, ISO/IEC 22123-1 and the following apply.

ISO and IEC 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/>

**3.1
measure**

variable to which a value is assigned as the result of *measurement* (3.2)

Note 1 to entry: The plural form “measures” is used to refer collectively to base measures, derived measures and indicators.

[SOURCE: ISO/IEC/IEEE 15939:2017, 3.15]

**3.2
measurement**

set of operations having the object of determining a value of a *measure* (3.1)

Note 1 to entry: Adapted from the International Vocabulary of Metrology – Basic and General Concepts and Associated Terms, 2012.

[SOURCE: ISO/IEC/IEEE 15939:2017, 3.17]

**3.3
measurement function**

algorithm or calculation performed to combine two or more *quality measure* (3.4) elements

[SOURCE: ISO/IEC 25021:2012, 4.7]

**3.4
quality measure**

derived measure that is defined as a *measurement function* (3.3) of two or more values of quality measure elements

[SOURCE: ISO/IEC 25021:2012, 4.13]

4 Format used for documenting the quality measures

The following information is given for each quality measure from [Table 1](#) to [30](#):

- a) ID: identification code of quality measure; each ID consists of the following three parts:
- abbreviated alphabetic code representing the quality characteristics as capital X and sub-characteristics as one capital X followed by lowercase x (for example, “PTb” denotes “time behaviour” measures for “performance efficiency”);
 - serial number of sequential orders within quality sub-characteristic;
 - G (generic) or S (specific) expressing potential categories of quality measure; where generic measures can be used whenever appropriate and specific measures can be used when relevant in a particular situation;
- b) name: quality measure name;
- c) description: the information provided by the quality measure;
- d) measurement function: algorithm or calculation performed to combine two or more quality measure elements.

5 Cloud service quality measures

5.1 Overview

The quality measures in this clause are listed by quality characteristics and sub-characteristics, in the order used in ISO/IEC TS 25052-1; and the word “measures” in this clause means quality measures.