Technical Report

ISO/IEC TR 23951

Second edition
2025-04

Information technology — Cloud computing — Best practices for using the cloud service level agreement (SLA) metric model

Technologies de l'information — Informatique en nuage — Bonnes pratiques pour l'utilisation du modèle métrique d'accord de niveau de service (SLA) dans le Cloud

Reference number
ISO/IEC TR 23951:2025(en)

© ISO/IEC 2025



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2025

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 Symbols and abbreviated terms **1**
5 Structure of this document **2**
6 Motivation **2**
6.1 Preamble 2
6.2 Audience and some user categories 2
6.2.1 General 2
6.2.2 Cloud service customer (CSC) 3
6.2.3 Cloud service provider (CSP) 3
6.2.4 Cloud service partner (CSN) 3
6.2.5 Regulators and policy makers 3
6.3 Usage patterns 4
6.3.1 General 4
6.3.2 Extract and clarify an existing metric description from an SLA 4
6.3.3 Create and share a metric description 4
6.3.4 Compare metric descriptions 4
6.3.5 Share a common foundation for a set of metrics 5
6.3.6 Build a metrics catalogue 5
6.4 Examples of scenarios and roles involved in sharing metric definitions 5
7 The metric model in practice: templates **6**
7.1 A brief reminder of the metric model 6
7.2 A tabular representation 7
7.2.1 General 7
7.2.2 The tabular representation for the Metric element 8
7.2.3 The tabular representation for the Expression elements 9
7.2.4 The tabular representation for the Rule elements 10
7.2.5 The tabular representation for the Parameter elements 10
8 An example of metric definition: the cloud service mean response time metric **11**
8.1 The cloud service mean response time metric: informal variant 11
8.1.1 Extracting metric elements from an SLA narrative 11
8.1.2 Using the tabular representation 12
8.1.3 Overall structure of the metric 13
8.2 The cloud service mean response time metric: more formal variant 14
8.2.1 A more formal variant of the metric 14
8.2.2 Adding a parameter 14
8.2.3 The metric rules 15
8.2.4 The metric expressions 15
8.2.5 Overall structure of the metric 16
8.2.6 Using constants 17
9 Guidelines for using the metric model with the tabular representation **19**
9.1 General 19
9.2 Guideline 1 about defining expression and rule languages 19
9.3 Guideline 2 about associating rules with expressions 19
9.4 Guideline 3 about relating expressions to each other 20
9.5 Guideline 4 about the identifiers of metric elements 20
9.6 Guideline 5 about rules specifically designed to support an expression 20
9.7 Guideline 6 about the role of parameters 21

© ISO/IEC 2025 – All rights reserved

9.8 Guideline 7 about representing constants 21
10 The simple cloud service availability metric 22
10.1 Measuring cloud service availability 22
10.1.1 General 22
10.1.2 Overall design approach 22
10.1.3 SLA rules and metric rules 22
10.2 The simple cloud service availability metric variant Simple_SAM_1 23
10.2.1 The Metric element 23
10.2.2 The metric rules 24
10.2.3 The metric expressions 25
10.2.4 The metric parameters 26
10.2.5 Overall structure of the metric 26
10.3 The simple cloud service availability metric variant Simple_SAM_2 27
10.3.1 Differences in metric design and assumptions 27
10.3.2 The Metric element 28
10.3.3 The metric rules 28
10.3.4 The metric parameters 29
10.3.5 The metric expressions 30
10.3.6 Overall structure of the metric 31
10.3.7 An alternative metric design using the Configuration element option 32
Bibliography 33

© ISO/IEC 2025 – All rights reserved

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 38, *Cloud computing and distributed platforms*.

This second edition cancels and replaces the first edition (ISO/IEC TR 23951:2020), which has been technically revised.

The main changes are as follows:

— alignment with ISO/IEC 22123;

— references to ISO/IEC 17788 and ISO/IEC 17789 have been changed to ISO/IEC 22123.

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.

© ISO/IEC 2025 – All rights reserved

Introduction

In most cases, cloud service providers (CSPs) and cloud service customers (CSCs) negotiate service level agreements (SLAs) which include service level objectives (SLOs) and service qualitative objectives (SQOs) for which CSPs make commitments. The commitments described in SLAs are expected to be measured against actual performance of the service to ensure compliance with the SLA. How actual performance compares against commitments in SLAs is explained in ISO/IEC 19086-2. Cloud SLAs are covered in ISO/IEC 19086-1 and in ISO/IEC 19086-4.

The metric model in ISO/IEC 19086-2 establishes common terminology, defines a model for specifying metrics for cloud SLAs, and includes applications of the model with examples. This document provides guidance and examples on using the metric model to compose the calculation of a cloud service performance measure in order to compare against an SLA commitment. A few examples from the SLOs listed in ISO/IEC 19086-1:2016, Clause 10 are given in the document, such as Cloud Service Mean Response Time and Simple Cloud Service Availability. As specific, measurable characteristics of a cloud service, SLOs are the basis for defining the metrics used to evaluate and compare agreements between parties.

In Clauses 8, 9 and 10 of this document, a basic explanation of these examples is provided using a practical method based on a tabular format that is a refinement of the informative tables provided in ISO/IEC 19086-2:2018, Annex B. The tabular representation described in this document serves as templates for designing metrics. Guidance in using the metric model with these templates is provided while developing metric examples.

© ISO/IEC 2025 – All rights reserved

Information technology — Cloud computing — Best practices for using the cloud service level agreement (SLA) metric model

1 Scope

This document provides best practices for using the ISO/IEC 19086-2 metric model, illustrated with examples.

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

ISO/IEC 19086-1, *Information technology — Cloud computing — Service level agreement (SLA) framework — Part 1: Overview and concepts*

ISO/IEC 19086-2, *Cloud computing — Service level agreement (SLA) framework — Part 2: Metric model*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 22123-1, ISO/IEC 19086-1 and, ISO/IEC 19086-2 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/

4 Symbols and abbreviated terms

CCRA	cloud computing reference architecture
CSC	cloud service customer
CSN	cloud service partner
CSP	cloud service provider
SLA	service level agreement
SLO	service level objective
SQO	service quality objective

© ISO/IEC 2025 – All rights reserved