INTERNATIONAL STANDARD

ISO/IEC 19086-2

First edition
2018-12

AMENDMENT 1
2023-01

Cloud computing — Service level agreement (SLA) framework —

Part 2:
Metric model

AMENDMENT 1

Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 38, *Cloud computing and distributed platforms*.

A list of all parts in the ISO/IEC 19086 series can be found on the ISO and IEC websites.

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8.1.5, second paragraph

Add a new second paragraph between the existing first and second paragraphs:

Any metric element (Metric, Expression, Rule, Parameter) may be used by more than one metric if it is defined using a unique id within the set of metrics it is used in. Any metric elements (Metric, Expression, Rule, Parameter) can reference other elements. Element shall be referenced by their ids. Within the context of the referencing element, ids used shall be unique.

Table 1

Replace Table 1 with the following table:

Table 1 — Metric details

Class Name	Metric		
Description	Information about the metric		
Attribute **-or-** **Element**	**Type**	**Multiplicity**	**Definition**
id	string	1	an identifier for the metric, unique within the context of usage of the metric
description	string	0..*	a description of the metric that may be provided for multiple languages.
source	string	1	the individual or organization who created the metric
scale	enumeratedList	1	classification of the type of measurement result when using the metric. The value of *scale* shall be "nominal, ordinal, interval, or ratio". SLOs shall use either the "interval" or "ratio" scale. SQOs shall use the "nominal" or "ordinal" scales.
category	string	0..1	a grouping of metrics related to each other
expression	Expression	1	The expression of the calculation of the metric. It shall be written using the appropriate id to represent an underlyingMetric, parameter, or rule.

Table 1 *(continued)*

parameter	Parameter	0..*	a parameter is used to define a constant (at runtime) needed in a metric expression or rule. A parameter's value is determined before the metric is used in a measurement. A parameter may be used by more than one metric if it is defined using a unique id within the set of metrics it is used in.
note	string	0..*	additional information about the metric and how to use it.
rule	Rule	0..*	a rule is used to constrain a metric and indicate possible method(s) for measurement.
underlyingMetric	Metric	0..*	a metric element that is used within an expression to define a variable. The expression shall use the underlyingMetric id to reference the underlyingMetric within the expression.
underlyingExpression	Expression	0..*	A supporting expression that is used within an expression, parameter, or rule.

Table 2

Replace Table 2 with the following table:

Table 2 — Expression details

Class Name	Expression		
Description	The expression of the calculation of the metric and supporting information		
Attribute **-or-** **Element**	**Type**	**Multiplicity**	**Definition**
id	string	1	an identifier for the expression, unique within the context of usage of the expression
description	string	0..*	a description of the expression
expressionStatement	string	1	the expression statement written using the ids to represent underlyingMetrics, parameters, and rules.
expressionLanguage	string	1	the language used to express the metric (i.e. ISO80000)
unit	string	0..1 required when scale is ratio or interval	real scalar quantity, defined and adopted by convention, with which any other quantity of the same kind can be compared to express the ratio of the two quantities as a number.
note	string	0..*	additional information about the expression

Table 3

Replace Table 3 with the following table:

Table 3 — Parameter details

Class Name	Parameter		
Description	A parameter is used to define a constant (at runtime) needed in a metric expression or rule. A parameter may be used by more than one metric if it is defined using a unique id within the set of metrics it is used in.		
Attribute -or- Element	Type	Multiplicity	Definition
id	string	1	an identifier for the parameter, unique within the context of usage of the parameter
description	string	0..*	a description of the parameter
parameterStatement	string	1	the statement or value of the parameter
unit	string	1	the unit of the parameter
note	string	0..*	additional information about the parameter

Table 4

Replace Table 4 with the following table:

Table 4 — Rule details

Class Name	Rule		
Description	A rule is used to constrain a metric and indicate possible method(s) for measurement. For instance an "AvailabilityDuringBusinessHour" metric could be defined with a scope that constrains some piece of a generic "availability" metric element that limits the measurement period to defined business hours. A rule describes constraints on the metric expression. A constraint can be expressed in many different formats (e.g. plain English, ISO 80000, SBVR)		
Attribute -or- Element	Type	Multiplicity	Definition
id	string	1	an identifier for the rule, unique within the context of usage of the rule
description	string	0..*	a description of the rule
ruleStatement	string	1	a constraint on the metric
ruleLanguage	string	1	the language used to express the rule in the ruleStatement
note	string	0..*	additional information about the rule

C.1.2, Metric (M_AVL_002) table

Replace the text in the second row, second column with:

Cloud Service Availability

Metric (M_TQD_001) table

Replace the text in the second row, second column with:

Total Qualified Downtime

Metric (M_QDT_001) table

Replace the text in the second row second column with:

Qualified Down time

C.1.3,

Replace with:

The following code represents the availability example described in C.1.1 using XML notation instead of tables to represent the metric.

```
<?xml version="1.0" encoding="UTF-8"?>
<Metrics xmlns=https://standards.iso.org/iso-iec/19086-2/ed-1/en
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <Metric description="Cloud Service Availability"
source="example" id="M_AVL_002" scale="RATIO">
        <Parameter id="P_001" parameterStatement="2.592 x10^6" unit="second"
            note="Parameter represents a 30 day billing cycle in seconds"/>
        <Expression id = "E_001" expressionStatement=" 100 x (P_001- M_TQD_001)/P_001"
expressionLanguage="ISO80000" unit="percentage"/>
        <UnderlyingMetricRef refid="M_TQD_001"/>
    </Metric>
    <Metric description="Total Qualified Downtime" source="example" id="M_TQD_001"
scale="RATIO" >
        <Expression id="E_001" expressionStatement="&#x3A3;(M_QDT_001)"
expressionLanguage="ISO80000" unit="second"/>
        <UnderlyingMetricRef refid="M_QDT_001"/>
    </Metric>
    <Metric description="Qualified Down Time" source="example" id="M_QDT_001"
scale="RATIO" >
        <Rule id="R_001" ruleLanguage="English" xml:lang="en"
            ruleStatement="The time duration starts when it is observed that the cloud
service is unavailable and ends when the cloud service is observed to be not unavailable
according to rule R_002, R_003, R_004"/>
        <Rule id="R_002" ruleLanguage="English" xml:lang="en" ruleStatement="The cloud
service provides no response"/>
        <Rule id="R_003" ruleLanguage="English" xml:lang="en"
            ruleStatement="the cloud service returns a server error response to a valid
user request during two or more consecutive one minute intervals"/>
        <Rule id="R_004" ruleLanguage="English" xml:lang="en"
            ruleStatement="the cloud service fails to deliver an average download time for
a reference document of one second or less. Unavailability due to scheduled maintenance
is excluded from these conditions and does not contribute towards unavailability
calculations."/>
        <Expression id="E_001" expressionStatement="&#x394;(t)"
expressionLanguage="ISO80000" unit="second"/>
    </Metric>
</Metrics>
```