

ETSI GS CIM 029 V1.1.1 (2024-04)



Context Information Management (CIM); NGSI-LD Implementation Conformance Statement

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Foreword

This Group Specification (GS) has been produced by ETSI Industry Specification Group (ISG) cross-cutting Context Information Management (CIM).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Executive summary

The present document is providing operational guidance to the one developing and using the NGSI-LD test suites. It lists the Implementation Conformance Statements (ICSSs).

Introduction

The ISG CIM group has defined an API for exchange of information contextualized in time, space and relation to other information using a property graph model with the intent that the associated protocol (called NGSI-LD) becomes the "glue" between all kinds of applications and databases associated with services for Smart Cities, Smart Agriculture, Smart Manufacturing, etc.

To be successful, the NGSI-LD API specification needs to be well understood and well implemented. The community of users will not be solely highly professional engineers employed by big companies but will include many small teams and SMEs and even hobbyists. Therefore, it is essential that the developers have access to not only the standard but also a test specification and a testing environment to check that their work is (and remains) conformant to the ETSI NGSI-LD specification.

The developers will usually write integration tests to validate the behaviour of their NGSI-LD implementation, but it is important to assert compliance to the specification based on a test suite agreed by the group creating the API specification, i.e. ETSI ISG CIM. Therefore, it is very important to create a set of ETSI-approved test cases.

What is more, the existence of such a test suite will likely help to increase the adoption of the NGSI-LD specification by giving developers a ready to use and complete set of sample requests.

The present document specifies the Implementation Conformance Statements (ICSs) aimed at listing the target capabilities of the NGSI-LD specification.

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1 Scope

The present document provides the Implementation Conformance Statement which is basically a checklist for a client-owner and developers of implementations so they know what parts of the specification will be tested and if any is optional.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] [ETSI GS CIM 009 \(V1.5.1\)](#): "Context Information Management (CIM); NGSI-LD API".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the following terms apply:

NOTE: The letters "NGSI-LD" were added to most terms to confirm that they are distinct from other terms of similar/same name in use in other organizations, however, in the present document the letters "NGSI-LD" are generally omitted for brevity.

NGSI-LD Central Broker: NGSI-LD Context Broker that only uses a local storage when serving NGSI-LD requests, without involving any external Context Sources

NGSI-LD Context Broker: architectural component that implements all the NGSI-LD interfaces

NGSI-LD Context Consumer: agent that uses the query and subscription functionality of NGSI-LD to retrieve context information

NGSI-LD Context Producer: agent that uses the NGSI-LD context provision and/or registration functionality to provide or announce the availability of its context information to an NGSI-LD Context Broker

NGSI-LD Context Registry: software functional element where Context Sources register the information that they can provide

NOTE: It is used by Distribution Brokers and Federation Brokers to find the appropriate Context Sources which can provide the information required for serving an NGSI-LD request.

NGSI-LD Context Source: source of context information which implements the NGSI-LD consumption and subscription (and possibly provision) interfaces defined by the present document

NOTE: It is usually registered with an NGSI-LD Registry so that it can announce what kind of information it can provide, when requested, to Context Consumers and Brokers.

NGSI-LD Distribution Broker: NGSI-LD Context Broker that uses both local context information and registration information from an NGSI-LD Context Registry, to access matching context information from a set of distributed Context Sources

NGSI-LD Federation Broker: Distribution Broker that federates information from multiple underlying NGSI-LD Context Brokers and across domains

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

API	Application Programming Interface
GS	Group Specification
HTTP	HyperText Transfer Protocol
ICS	Implementation Conformance Statement
ISG	Industry Specification Group
ISO	International Organization for Standardization
IUT	Implementation Under Test
JSON	JavaScript Object Notation
JSON-LD	JSON Linked Data
NGSI	Next Generation Service Interfaces
PDU	Protocol Data Unit
PICS	Profile Implementation Conformance Statement
SUT	Implementation Under Test
TB	Technical Body
ToR	Terms of Reference
TP	Test Purposes

4 Implementation Conformance Statement

An ICS pro forma which conforms to this ICS pro forma specification shall be technically equivalent to annex A, and shall preserve the numbering and ordering of the items in annex A.

An ICS which conforms to this PICS pro forma specification shall:

- a) describe an implementation which claims to conform to ETSI GS CIM 009 [1];
- b) be a conforming ICS pro forma which has been completed in accordance with the instructions for completion given in clause A.1;
- c) include the information necessary to uniquely identify both the supplier and the implementation.

Annex A (normative): ICS Pro forma

A.0 The right to copy

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the ICS pro forma in this annex so that it can be used for its intended purposes and may further publish the completed ICS pro forma.

A.1 Guidance for completing the ICS pro forma

A.1.1 Purposes and structure

The purpose of this ICS pro forma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in ETSI GS CIM 009 may provide information about the implementation in a standardized manner.

The ICS pro forma is subdivided into clauses for the following categories of information:

- guidance for completing the ICS pro forma;
- identification of the implementation;
- global statement of conformance;
- ICS pro forma tables.

A.1.2 Abbreviations and conventions

The ICS pro forma contained in annex A is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7.

Item column

The item column contains a number which identifies the item in the table.

Item description column

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

Reference column

The reference column gives reference to the relevant sections in core specifications.

Status column

The various status used in this annex are in accordance with the rules in table A.1.2-1.

Table A.1.2-1: Key to status codes

Status code	Status name	Meaning
m	mandatory	The capability shall be supported. It is a static view of the fact that the conformance requirements related to the capability in the reference specification are mandatory requirements. This does not mean that a given behaviour shall always be observed (this would be a dynamic view), but that it shall be observed when the implementation is placed in conditions where the conformance requirements from the reference specification compel it to do so. For instance, if the support for a parameter in a sent PDU is mandatory, it does not mean that it shall always be present, but that it shall be present according to the description of the behaviour in the reference specification (dynamic conformance requirement).
o	optional	The capability may or may not be supported. It is an implementation choice.
n/a	not applicable	It is impossible to use the capability. No answer in the support column is required.
c.<integer>	conditional	The requirement on the capability ("m", "o", "n/a") depends on the support of other optional or conditional items. <integer> is the identifier of the conditional expression.
o.<integer>	qualified optional	For mutually exclusive or selectable options from a set. <integer> is the identifier of the group of options, and the logic of selection of the options.

Mnemonic column

The Mnemonic column contains mnemonic identifiers for each item.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7, are used for the support column:

N or n	not supported by the implementation
N/A, n/a or no	answer required (allowed only if the status is N/A, directly or after evaluation of a conditional status)
Y or y	supported by the implementation

References to items

For each possible item answer (answer in the support column) within the ICS pro forma there exists a unique reference, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table.

EXAMPLE 1: A.5/4 is the reference to the answer of item 4 in table A.5.

EXAMPLE 2: A.6/3b is the reference to the second answer (i.e. in the second support column) of item 3 in table 6 of annex A.

Values allowed column

The values allowed column contains the type, the list, the range or the length of values allowed. The following notations are used:

range of values: <min value> .. <max value>

EXAMPLE: 5 .. 20

list of values: <value1>, <value2>, ..., <valueN>

EXAMPLE 1: 2,4,6,8,9

EXAMPLE 2: '1101'B, '1011'B, '1111'B

EXAMPLE 3: '0A'H, '34'H, '2F'H