ETSI GS CIM 012 V1.1.1 (2021-03)

GROUP SPECIFICATION

Context Information Management (CIM);
NGSI-LD Test Suite Structure

ETSI

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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).

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Executive summary

The present document is providing the structure of the NGSI-LD test suite. It identifies the different groups and subgroups that are used to identify and classify the hierarchy of the Test Cases inside the Test Suite.

Introduction

The ISG CIM group has defined an API for exchange of information contextualised 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 defines the operational structure of the test suite: it first identifies the different levels of groups, then defines the common behaviours and finally specifies the complete structure of the NGSI-LD test suite.

1   Scope

The present document defines the organization or grouping of test cases based on the functionality to be tested (e.g. registration, subscription, query, etc.) and - most importantly - selects minimal subsets ("narrower scope") of functionality to permit testing of the main features of an operating NGSI-LD system.

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 (V1.3.1): "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.

Not applicable.

3   Definition of terms, symbols and abbreviations

3.1   Terms

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

context registry: software functional element where context sources register the information that they can provide

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

entity: informational representative of something that is supposed to exist in the real world, physically or conceptually

3.2   Symbols

Void.

3.3   Abbreviations

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

NGSI-LD   Next Generation Service Interfaces Linked Data
TSS   Test Suite Structure

4   Test Suite Structure (TSS)

4.1   Test groups

The test groups are organized in 2 levels:

- The first level covers operations related with **context information**: entities that represent something that exist in the real world and subscriptions.

- The second level covers operations related with the **context source** which implements the NGSI-LD consumption and subscription (and possibly provision) interfaces.

4.2   Common Services Functions Subgroups

The test subgroups organize context information and context source in terms of creation/edition/removal of data, consuming data and subscribing:

- Provision/Registration

- Consumption/Discovery

- Subscription

4.3   NGSI-LD Resource Primitives specific Operations

Specified test scenarios shall contain test cases to verify the following common behaviours, when applicable, as specified in ETSI GS CIM 009 [1]:

- Error types

- Error response payload body

- General NGSI-LD validation

- Default @context assignment

- Operation execution

- Term to URI expansion or compaction

- JSON-LD merge-patch behaviour

- Pagination behaviour

- Multi-tenant behaviour

When applied to the HTTP binding, specified test scenarios shall also contain test cases to verify the following HTTP common behaviours, when applicable, as specified in ETSI GS CIM 009 [1]:

- Error types

- Reporting errors

- HTTP request preconditions

- JSON-LD @context resolution

- HTTP response common requirements

- Simplified representation of entities

- Notification behaviour

- Context Source Notification behaviour

- Pagination behaviour

- Including system-generated attributes

- Simplified temporal representation of entities

- Counting number of results

- Tenant specification

Most of these common behaviours only apply to a specific subset of the endpoints. In this case, they are implemented as specific Test Purposes inside the corresponding Tests Scenarios. The common behaviours that apply to almost every endpoint are implemented as specific Test Cases on a subset of the Test Scenarios.

4.4   Test Suite Structure (TSS) for NGSI-LD

Based on the assumptions of the previous clauses, the test suite structure proposed is:

```
Group 1:     Context Information (CI)
   Subgroup 1.1:      Provision (PROV)
      Subgroup 1.1.1:     Entities (E)
         Test Scenario 1.1.1.1:     Create Entity (001)
         Test Scenario 1.1.1.2:     Delete Entity (002)
      Subgroup 1.1.2:     Batch Entities (BE)
         Test Scenario 1.1.2.1:     Create batch of Entities (003)
         Test Scenario 1.1.2.2:     Upset batch of Entities (004)
         Test Scenario 1.1.2.3:     Update batch of Entities (005)
         Test Scenario 1.1.2.4:     Delete batch of Entities (006)
      Subgroup 1.1.3:     Temporal Entity (TE)
         Test Scenario 1.1.3.1:     Create temporal representation of Entity (007)
         Test Scenario 1.1.3.2:     Update temporal representation of Entity (008)
         Test Scenario 1.1.3.3:     Delete temporal representation of Entity (009)
      Subgroup 1.1.4:     Entity Attributes (EA)
         Test Scenario 1.1.4.1:     Append Entity Attributes (010)
         Test Scenario 1.1.4.2:     Update Entity Attributes (011)
         Test Scenario 1.1.4.3:     Partial Attribute Update (012)
         Test Scenario 1.1.4.4:     Delete Entity Attribute (013)
      Subgroup 1.1.5:     Temporal Entity Attributes (TEA)
         Test Scenario 1.1.5.1:     Append Attributes (014)
         Test Scenario 1.1.5.2:     Delete Attribute (015)
         Test Scenario 1.1.5.3:     Partial update Attribute instance (016)
         Test Scenario 1.1.5.4:     Delete Attribute instance (017)
   Subgroup 1.2:      Consumption (CONS)
      Subgroup 1.2.1:     Entity (E)
         Test Scenario 1.2.1.1:     Retrieve Entity (018)
         Test Scenario 1.2.1.2:     Query Entities (019)
      Subgroup 1.2.2:     Temporal Entity (TE)
         Test Scenario 1.2.2.1:     Retrieve temporal evolution of Entity (020)
         Test Scenario 1.2.2.2:     Query temporal evolution of Entity (021)
      Subgroup 1.2.3:     Discovery (DISC)
         Test Scenario 1.2.3.1:     Retrieve Available Entity Types (022)
```

Annex A (informative):
Change History

Date	Version	Information about changes
July, 15th 2020	0.0.1	First draft of document
July, 23rd 2020	0.0.2	Improvement of template and corrections
July, 28th 2020	0.0.3	Revision by TTF leader
September, 10th 2020	0.0.4	Submitted as contribution to ETSI ISG CIM
October, 12th 2020	0.1.0	Submitted for stable draft decision
October, 22nd 2020	1.0.1	Align version with expectation from the ToR
December, 7th 2020	1.1.0	Add new endpoints from v1.3.1 and test scenarios for common behaviours
February, 15th 2021	1.1.0	Submitted for final version decision
March, 3rd 2021	1.1.0	Final Draft approval
March, 12th 2021	1.1.1	Technical Officer review for EditHelp Publication pre-processing

History

Document history		
V1.1.1	March 2021	Publication