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Context Information Management (CIM); Application Programming Interface (API)

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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

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Executive summary

The present document formally describes the Context Information Management API Specification (preliminary). The Context Information Management API allows users to provide, consume and subscribe to context information in multiple scenarios and involving multiple stakeholders. It enables close to real-time access to information coming from many different sources (not only IoT data sources).

Introduction

The present document defines the Context Information Management API Specification (preliminary). The Context Information Management API allows users to provide, consume and subscribe to context information in multiple scenarios and involving multiple stakeholders.

The present document is labelled "preliminary" because it will be published widely in order to elicit comment and critique from the ICT community, and their comments will be used to modify and improve the later final API specification. The present document contains two annexes describing a list of pending issues and features that are planned to be addressed in the near future. Accordingly, a feedback process is described in the present document.

The ETSI ISG CIM has decided to give the name "NGSI-LD" to the Context Information Management API. The rationale is to reinforce the fact that the present document leverages on the former OMA NGSI 9 and 10 interfaces [i.3] and FIWARE NGSIv2 [i.9] to incorporate the latest advances from Linked Data.

1 Scope

The purpose of the present document is the (preliminary) definition of a standard API for Context Information Management (NGSI-LD API) enabling close to real-time access to information coming from many different sources (not only IoT data sources). The present document defines how such an API enables applications to perform updates on context, register context providers which can be queried to get updates on context, query information on current and historic context information and subscribe to receive notifications of context changes. The criteria for choice of the API characteristics are based on results in the Use Cases [i.1] and Gap Analysis [i.2] work items. The present document is labelled "preliminary" because it will be published widely in order to elicit comment and critique from the user communities and their comments will be used to modify and improve the later final API specification.

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] W3C Recommendation 25 February 2014: "RDF Schema 1.1".

NOTE: Available at https://www.w3.org/TR/2014/REC-rdf-schema-20140225/.

[2] W3C Recommendation 16 January 2014: "JSON-LD 1.0 - A JSON-based Serialization for Linked Data".

NOTE: Available at http://www.w3.org/TR/2014/REC-json-ld-20140116/.

[3] IETF RFC 7231: "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content".

[4] IETF RFC 7232: "Hypertext Transfer Protocol (HTTP/1.1): Conditional Requests".

[5] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".

[6] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[7] IETF RFC 5988: "Web Linking".

[8] IETF RFC 7946: "The GeoJSON Format".

[9] IETF RFC 8141: "Uniform Resource Names (URNs)".

[10] IETF RFC 7807: "Problem Details for HTTP APIs".

[11] IEEE POSIX 1003.2™-1992: "IEEE Standard for Information Technology - Portable Operating System Interfaces (POSIX®) - Part 2: Shell and Utilities".

[12] IETF RFC 5234: "Augmented BNF for Syntax Specifications: ABNF".

[13] Unicode® Technical Standard #10: "Unicode Collation Algorithm".

NOTE: Available at http://unicode.org/reports/tr10/.

[14] Open Geospatial Consortium Inc. OGC 06-103r4: "OpenGIS® Implementation Standard for Geographic information - Simple feature access - Part 1: Common architecture".

NOTE: Available at https://portal.opengeospatial.org/files/?artifact_id=25355.

[15] UN/CEFACT Common Codes for specifying the unit of measurement.

NOTE: Available at http://www.unece.org/fileadmin/DAM/cefact/recommendations/rec20/rec20_Rev9e_2014.xls.

[16] IETF RFC 7396: "JSON Merge Patch".

[17] ISO 8601: 2004: "Data elements and interchange formats -- Information interchange -- Representation of dates and times".

NOTE: Available at http://www.iso.org/iso/catalogue_detail?csnumber=40874.

[18] IETF RFC 2818: "HTTP Over TLS".

NOTE: Available at https://tools.ietf.org/html/rfc2818.

[19] IETF RFC 5246: "The Transport Layer Security (TLS) Protocol Version 1.2".

NOTE: Available at https://tools.ietf.org/html/rfc5246.

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] ETSI GR CIM 002: "Context Information Management (CIM); Use Cases (UC)".

NOTE: Available at https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=51347.

[i.2] ETSI GR CIM 003: "Context Information Management (CIM); Architecture and Standardization Gaps".

NOTE: Available at https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=51348.

[i.3] OMA OMA-TS-NGSI-Context-Management-V1-0-20100803-C. 03 August 2010: "NGSI Context Management".

[i.4] ETSI TS 103 264 (V2.1.1): "SmartM2M; Smart Appliances; Reference Ontology and oneM2M Mapping".

NOTE: Available at http://www.etsi.org/deliver/etsi_ts/103200_103299/103264/02.01.01_60/ts_103264v020101p.pdf.

[i.5] NGSI-LD Wrapper. Experimental proxy for adaptation between FIWARE and NGSI-LD.

NOTE: Available at https://github.com/Fiware/NGSI-LD_Wrapper.

[i.6] Graph Databases: "New Opportunities for Connected Data". O'Reilly 2nd Edition. Webber, Robinson, et al. ISBN:1491930896 9781491930892.

[i.7] JSON-LD Playground. Experimentation tool for JSON-LD.

NOTE: Available at https://json-ld.org/playground/.