



The Standards People

# New Features and Relevant Fixes in NGSI-LD v1.4.2

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# Overview

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- New Features in NGSI-LD v1.4.2
  - Support for natural languages via LanguageProperty
  - Temporal Aggregation Functions
- Some Fixes in NGSI-LD v1.4.2 and their Rationale
  - Align Table 6.8.3.2-1 with clause 5.10.2-2 for query via attrs
  - Dot vs. comma in DateTime
  - id and type for JSON-LD compliance

[CIM 009v1.4.2] [https://www.etsi.org/deliver/etsi\\_gs/CIM/001\\_099/009/01.04.02\\_60/gs\\_CIM009v010402p.pdf](https://www.etsi.org/deliver/etsi_gs/CIM/001_099/009/01.04.02_60/gs_CIM009v010402p.pdf)

# New Features in NGSI-LD v1.4.2

# (Natural) Language Properties in NGSI-LD

- Example – place with name in multiple languages

```
{
  "id": "urn:ngsi-ld:PointOfInterest:001",
  "type": "PointOfInterest",
  "exonym": {
    "type": "LanguageProperty",
    "languageMap": {
      "fr": "Grand Place",
      "nl": "Grote Markt"
    }
  }
}
```

- Languages are specified using BCP47 language codes, e.g. “fr”, “en” or “en-US”
- Language filter is added as parameter, e.g. **lang=“fr”**, in this case the Language Property is converted to a regular Property using the specified language in the result:

```
{
  "id": "urn:ngsi-ld:PointOfInterest:001",
  "type": "PointOfInterest",
  "exonym": {
    "type": "Property",
    "value": "Grand Place"
  }
}
```

- In a filter query, either an explicit language to match is specified, e.g. **exonym[fr]= "Grand Place"** or any language can match, e.g. **exonym[\*]= "Grand Place"**

# Suggested Best Practices for Internationalization

- Use standard vocabulary from schema.org identify the language and sameAs relationship to refer to the same entity, e.g. provided in a different language:
  - **"inLanguage"**: "http://schema.org/inLanguage"
  - **"sameAs"**: http://schema.org/sameAs

```

{
  "type": "Event",
  "id": "urn:ngsi-Id:Event:bonjourLeMonde",
  "name": {
    "type": "Property",
    "value": "Bonjour le Monde"
  },
  "sameAs": [
    {
      "type": "Relationship",
      "datasetId" : "urn:ngsi-Id:Relationship:1"
      "object": "urn:ngsi-Id:Event:helloWorld",
      "inLanguage": {
        "type": "Property",
        "value": "en"
      }
    }
  ],
  {
    "type": "Relationship",
    "object": "urn:ngsi-Id:Event:halloWelt"
    "inLanguage": {
      "type": "Property",
      "value": "de"
    }
  }
]
}

```

# Aggregation Operators for Temporal Query Language - Operations

- Allows aggregation of temporal information

Operator	Meaning*
totalCount	Calculate the number of times the value has been updated inside the period
distinctCount	Calculate the count of distinct values inside the period
sum	Calculate the sum of the values inside the period
avg	Calculate the average of the values inside the period
min	Calculate the minimum value inside the period
max	Calculate the maximum value inside the period
stddev	Calculate the standard deviation of the values inside the period
sumsq	Calculate the sum of the square of the values inside the period

\*Meaning for numbers, some operators are also available for other datatypes, see specification

# Aggregation Operators for Temporal Query Language – Aggregation Period



- The duration is expressed using the **ISO 8601 Duration** Representation
- The duration shall be a string in the format
  - P[n]Y[n]M[n]DT[n]H[n]M[n]S (Years, Months, Days, Hours, Minutes, Seconds)
  - or P[n]W (Weeks)

where [n] is replaced by the value for each of the date and time elements that follow  
P is the duration designator and T is the time designator

- Example: "P3Y6M4DT12H30M5S" represents a duration of “three years, six months, four days, twelve hours, thirty minutes, and five seconds”.
- Date and time elements including their designator may be omitted if their value is zero, e.g. PT4M represents a duration of “4 minutes.”
- Lower-order elements may be omitted for reduced precision
- A duration of 0 seconds (e.g., expressed as PT0S or P0D) is valid and is interpreted as a duration spanning the whole time range specified by the temporal query

# Aggregation Operators for Temporal Query Language - Example

```
GET /ngsi-ld/v1/temporal/entities/?type=Vehicle&q=brandName!=Mercedes&attrs=speed&timerel=between&timeAt=2018-08-01T12:00:00Z&endTimeAt=2018-08-01T13:00:00Z&aggrMethods=max,avg&aggrPeriodDuration=PT4M&options=aggregatedValues
```

```
Accept: application/json
```


```
Link: <http://example.org/ngsi-ld/latest/aggregatedContext.jsonld>; rel="http://www.w3.org/ns/json-ld#context"; type="application/ld+json"
```

```
200 OK
```

```
Content-Type: application/json
```

```
[
  {
    "id": "urn:ngsi-ld:Vehicle:B9211",
    "type": "Vehicle",
    "speed": {
      "type": "Property",
      "max": [
        [120, "2018-08-01T12:00:00Z", "2018-08-01T12:04:00Z"],
        [100, "2018-08-01T12:04:00Z", "2018-08-01T12:08:00Z"]
      ],
      "avg": [
        [120, "2018-08-01T12:00:00Z", "2018-08-01T12:04:00Z"],
        [90, "2018-08-01T12:04:00Z", "2018-08-01T12:08:00Z"]
      ]
    }
  }
]
```



A hand holding a transparent tablet that displays a glowing blue globe of the Earth. The globe is centered on the Atlantic Ocean. Overlaid on the globe and the tablet are various digital elements: a grid of white lines, a circular gauge-like border around the globe, and some faint, illegible text and icons at the bottom left of the tablet. The background is a soft, out-of-focus blue.

# Some Fixes in NGSI-LD v1.4.2 and their Rationale

# Important Fixes

## Align Table 6.8.3.2-1 with clause 5.10.2-2 for query via attrs

In Table 6.8.3.2-1 the required presence of type or attribute (possibly also geoquery or query) was added to reflect the behaviour described in the referenced clause 5.10.2

[CIM 009v1.4.2] Clause **6.8.3.2**

## Dot vs. comma in DateTime

We followed ISO8601 that prefers comma for separating decimal parts of timestamps – unfortunately the world primarily uses dots and this creates problems. Change: allow both for now, but dots are now the preferred representation

[CIM 009v1.4.2] Clause **4.6.3**

## id and type for JSON-LD compliance

NGSI-LD uses id and type, which are mapped to @id and @type generally used in JSON-LD. NGSI-LD now also allows the direct use of @id and @type in user-provided NGSI-LD content.

[CIM 009v1.4.2] Clause **4.4**