

Request for Comments for RDS Trail on 09.05.2022

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STI2

Abstract. *This document is a Request for Comments (RC) for the Request for Domain Specifications (RDS) on Trail from May 09, 2022.*

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1. Introduction

The requested domain specification is about extending the schema.org vocabulary with a new Trail type based on the existing Place type. The type is additionally used in the domain of newly requested properties.

In the remainder of the document we provide our suggestions in relation to the requests made in the RDS. We then conclude with a summary and some general remarks.

2. Suggestions

This section presents our suggestions according to the requests made for the Trail Domain Specification. Each subsection contains a suggestion and starts with a quote from the RDS followed by our answer including how the request is recommended to be implemented.

2.1 Request for a new type Trail

*“In this RDS we propose a Domain Specification (DS) for **Trails**, based on **schema.org/Place** or **odta:Trail** respectively, as used in the GNTB’s “Knowledge Graph für den Deutschlandtourismus” project.”*

A type to represent touristically relevant trails is requested. An extension of the schema.org requested in the form of a new subtype of Place. Since the type does not exist in schema.org and brings new properties, we take on this proposed odta:Trail type and recommend it as a subtype of schema:Place.

Extension to schema.org

Type	Subtype of
odta:Trail	schema:Place

2.2 Request for a property additionalProperty

PROPERTY	CARDINALITY	RANGE TYPES
<i>additionalProperty</i>	0 +	<i>PropertyValue</i>

An optional property for the Trail type is requested to be able to specify additional properties for trails. Since Trail is a subtype of Place, the property can be used without any modification. Note that additionalProperty allows a very generic mechanism to define property values. The canonical values for certain key-value pairs can be defined by ODTA.

Representation with schema.org

Property	Domain	Range
schema:additionalProperty	odta:Trail	schema:PropertyValue

2.3 Request for a property address

PROPERTY	CARDINALITY	RANGE TYPES
<i>address</i>	0 +	<i>PostalAddress</i> <i>Text</i>

A property for specifying the address of trails is requested. Although schema.org allows the usage of the address property on trails, conceptually it could be a bizarre modeling approach to specify addresses for trails, as they may cover many different points. Does the address relate to the start point or the endpoint? We kindly ask for an example where such a modeling makes sense.

Representation with schema.org

Property	Domain	Range
schema:address	odta:Trail	schema:PostalAddress

2.4 Request for a property aggregateRating

PROPERTY	CARDINALITY	RANGE TYPES
<i>aggregateRating</i>	0 - 1	<i>AggregateRating</i>

A property for specifying the aggregate user rating for trails is requested. The proposed aggregateRating property of Place can be used for this purpose. A trail has maximum one aggregateRating value.

Representation with schema.org

Property	Domain	Range
schema:aggregateRating	odta:Trail	schema:Text

2.5 Request for a property containedInPlace

PROPERTY	CARDINALITY	RANGE TYPES
<i>containedInPlace</i>	0 +	<i>Place</i>

A property for specifying the places a trail is contained in is requested. The proposed containedInPlace property of Place can be used for this purpose.

Representation with schema.org

Property	Domain	Range
schema:containedInPlace	odta:Trail	schema:Place

2.6 Request for a property containsPlace

PROPERTY	CARDINALITY	RANGE TYPES
<i>containsPlace</i>	0 +	<i>Place</i>

A property for specifying the places a trail contains is requested. The proposed containsPlace property can be used for this purpose.

Representation with schema.org

Property	Domain	Range
schema:containsPlace	odta:Trail	schema:Place

2.7 Request for a property description

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>description</i>	<i>0 +</i>	<i>Text</i> <i>Localized Text</i>

A property for specifying descriptions of a trail is requested. The proposed description property of schema.org can be used for this purpose. Note that the description values can be in multiple languages which means the usage of RDF language-tagged strings¹ is advised when generating data according to this DS.

Representation with schema.org

Property	Domain	Range
schema:description	odta:Trail	schema:Text

2.8 Request for a property endLocation

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>odta:endLocation</i>	<i>0 +</i>	<i>Place</i>

A property for specifying the endpoint of a trail is requested. Schema.org has the toLocation property that may be useful, however that property is only used on actions. We accept the proposed odta:endLocation property for trails.

Extension to schema.org

Property	Domain	Range
odta:endLocation	odta:Trail	schema:Place

¹ <https://www.w3.org/TR/rdf11-concepts/#section-Graph-Literal>

2.9 Request for a property geo

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>geo</i>	<i>1</i>	GeoCoordinates GeoShape

A property for specifying the geo coordinates of a trail is requested. The proposed geo property of schema.org can be used for this purpose. The RDS specifies that a trail can have exactly one pair of geo coordinates.

Representation with schema.org

Property	Domain	Range
schema:geo	odta:Trail	schema:GeoCoordinates

2.10 Request for a property hasMap

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>hasMap</i>	<i>0 - 1</i>	<i>URL</i>

A property for specifying the URL for a map of a trail is requested. The proposed hasMap property of schema.org can be used for this purpose. A trail can have maximum one value for the hasMap property.

Representation with schema.org

Property	Domain	Range
schema:hasMap	odta:Trail	schema:URL

2.11 Request for a property identifier

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>identifier</i>	<i>0 +</i>	<i>Text</i> <i>PropertyValue</i> <i>URL</i>

A property for specifying a custom identifier for a trail instance is requested. The proposed identifier property of schema.org can be used for this purpose.

Representation with schema.org

Property	Domain	Range
schema:identifier	odta:Trail	schema:Text OR schema:PropertyValue OR schema:URL

2.12 Request for a property image

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>image</i>	<i>0 +</i>	<i>URL</i> <i>ImageObject</i>

A property for specifying images of a trail is requested. The proposed image property of schema.org can be used for this purpose.

Representation with schema.org

Property	Domain	Range
schema:image	odta:Trail	schema:ImageObject OR schema:URL

2.13 Request for a property name

PROPERTY	CARDINALITY	RANGE TYPES
<i>name</i>	1 +	<i>Text</i> <i>Localized Text</i>

A property for specifying names of a trail is requested. The proposed name property of schema.org can be used for this purpose. Note that the name values can be in multiple languages which means the usage of RDF language-tagged strings² is advised when generating data according to this DS. A trail must have at least one name.

Representation with schema.org

Property	Domain	Range
schema:name	odta:Trail	schema:Text

2.14 Request for a property potentialAction

PROPERTY	CARDINALITY	RANGE TYPES
<i>potentialAction</i>	0 +	<i>ExerciseAction</i>

A property for the potential actions that can be taken on a Trail is requested. Although the potentialAction property of schema.org can be used on odta:Trail, we do not understand the reason why the range is restricted to ExerciseAction. TravelAction may be more suitable for this purpose. We kindly ask for an example where ExerciseAction as range makes sense.

Restriction of schema.org

Property	Domain	Range
schema:potentialAction	odta:Trail	??

² <https://www.w3.org/TR/rdf11-concepts/#section-Graph-Literal>

2.15 Request for a property sameAs

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>sameAs</i>	<i>0 +</i>	<i>URL</i>

A property for specifying the duplicate instances of a trail instance is requested. The proposed sameAs property of schema.org can be used for this purpose.

Representation with schema.org

Property	Domain	Range
schema:sameAs	odta:Trail	schema:URL

2.16 Request for a property sdLicense

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>sdLicense</i>	<i>0 +</i>	<i>URL</i> <i>CreativeWork</i>

A property for specifying the license of an instance is requested. This request is not relevant only for the trail instances but for all instances. The property provides a straightforward way to attach licenses at instance level. Schema.org defines an sdLicense property only on CreativeWork type, but the RDS wants to extend the domain of this property to Thing. We take on this proposal. See the LodgingBusinessDS RC for potential values of this property from the CreativeCommons licenses.

Extension to schema.org

Property	Domain	Range
schema:sdLicense	odta:Trail	schema:URL OR schema:CreativeWork

2.17 Request for a property startLocation

PROPERTY	CARDINALITY	RANGE TYPES
<i>odta:startLocation</i>	0 +	<i>Place</i>

A property for specifying the starting point of a trail is requested. Schema.org has the `fromLocation` property that may be useful, however that property is only used on actions. We accept the proposed `odta:startLocation` property for trails.

Extension to schema.org

Property	Domain	Range
<code>odta:startLocation</code>	<code>odta:Trail</code>	<code>schema:Place</code>

2.18 Request for a property typeOfTrail

PROPERTY	CARDINALITY	RANGE TYPES
<i>odta:typeOfTrail</i>	0 +	<i>Localized Text</i>

A property for the specification of different trail types is requested. Note that the trail type values can be in multiple languages which means the usage of RDF language-tagged strings³ is advised when generating data according to this DS. We would like to also ask whether there is a canonical list of the trail types that could be defined as enumeration members by ODTA.

Extension to schema.org

Property	Domain	Range
<code>odta:typeOfTrail</code>	<code>odta:Trail</code>	<code>schema:Text</code>

³ <https://www.w3.org/TR/rdf11-concepts/#section-Graph-Literal>

2.19 Request for a property url

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>url</i>	<i>0 +</i>	<i>URL</i>

A property for specifying the url of a page that represents a trail is requested. The url property of schema.org can be used for this purpose. Note that a URI for a specific instance should be defined by the means of RDF (e.g., @id property of JSON-LD).

Representation with schema.org

Property	Domain	Range
schema:url	odta:Trail	schema:URL

2.20 Request for a property wayPoint

<i>PROPERTY</i>	<i>CARDINALITY</i>	<i>RANGE TYPES</i>
<i>odta:wayPoint</i>	<i>0 +</i>	<i>Place</i> <i>ItemList</i>

A property for specifying various relevant places on a trail. Schema.org does not have property that covers this case completely. Therefore we take on the proposal of a new odta:wayPoint property. The range contains Place and ItemList types. ItemList type is necessary for the cases where the ordering of the way points is important as the ItemList type contains a property for ordering the items in the list.

Extension to schema.org

Property	Domain	Range
odta:wayPoint	odta:Trail	schema:Place schema:ItemList OR

3. Conclusion

In this Request for Comments, we provided our suggestions for building a domain specification for the Trail type of schema.org. We were able to take on most of the requests directly, as they were already conveniently mapped to schema.org. We have the following points open for discussion:

- The usage of the address property for trails: What does address relate to?
- Why is the range of the potential action restricted to ExerciseAction?
- Can the range of the typeOfTrail property be an enumeration?

The DS must be discussed within the ODTA in the next stage on GitHub.

Request for Domain Specification (RDS)

Title:	Trail
Last Modification Date:	9.5.2022
Authors	Elias Kärle (Onlim)
URI	https://semantify.it/ds/nBTyKDsKX

Abstract

In this RDS we propose a Domain Specification (DS) for **Trails**, based on **schema.org/Place** or **odta:Trail** respectively, as used in the GNTB's "Knowledge Graph für den Deutschlandtourismus" project. The DS holds all properties required to annotate a trail sufficiently using the vocabulary of schema.org and the extension of **odta:Trail**. To annotate the type of license applied to the data set, we suggest additionally modifying the original schema.org vocabulary.

1. What is the topic that should be discussed

Explain what the requested domain specification is about (1-4 pages)

The DS presented in this RDS is about **trails** (<https://semantify.it/ds/nBTyKDsKX>) which are used in the GNTB's "Knowledge Graph für den Deutschlandtourismus" project. Hereby, we want to promote the properties, their cardinalities and their proposed ranges to be accepted by the ODTA to reach a broader audience and to enable a more streamlined data exchange process.

2. Why is this topic important for a broader audience

Explain why this topic is important for ODTA members and beyond (1-4 pages)

This topic is important because **trails** are amongst the most important data types used in touristic data exchange.

3. (Optional) How can/cannot this issue be represented in schema.org

Give a few examples of schema.org types and properties that can be used for the domain specification you are requesting. Additionally, you can give some examples of what cannot be expressed with the current schema.org vocabulary (1-4 pages)

The **trail** itself can not be represented solely by pure schema.org. Therefore we propose an extension to schema:Place. Additionally, to allow annotating a license, we propose to extend schema.org (see Section 4).

A table of the proposed properties which can be represented in schema.org:

PROPERTY	CARDINALITY	RANGE TYPES
identifier	0 +	Text URL
name	1 +	Localized Text
description	0 +	Localized Text
aggregateRating	0 - 1	AggregateRating
geo	1	GeoShape GeoCoordinates
hasMap	0 - 1	URL
additionalProperty	0 +	PropertyValue
image	0 +	URL ImageObject
containsPlace	0 +	Place
containedInPlace	0 +	Place
potentialAction	0 +	ExerciseAction
url	0 - 1	URL
sameAs	0 +	URL
address	0 +	PostalAddress
sdLicense	0 +	CreativeWork URL

Table 1: First-level schema.org properties of the proposed DS

4. (Optional) How should schema.org be extended if necessary

Give a few examples of how schema.org should be extended (i.e., introducing which new types and properties) to cover your needs (1-4 pages)

To allow the annotation of a license, we propose to extend schema.org in a way that schema:sdLicense's domain is generalized to schema:Thing (see Listing 1)

```
<https://schema.org/sdLicense> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#Property> .
<https://schema.org/sdLicense> <http://www.w3.org/2000/01/rdf-schema#comment> "This term
is proposed for full integration into Schema.org, pending implementation feedback and adoption
from applications and websites."@en .
<https://schema.org/sdLicense> <http://www.w3.org/2000/01/rdf-schema#label>
"sdLicense"@en .
<https://schema.org/sdLicense> <https://schema.org/domainIncludes>
<https://schema.org/Thing> .
<https://schema.org/sdLicense> <https://schema.org/rangeIncludes>
<https://schema.org/CreativeWork> .
<https://schema.org/sdLicense> <https://schema.org/rangeIncludes> <https://schema.org/URL> .
```


Listing 1: Changing schema:sdLicense's domain to schema:Thing (N-Triples Syntax).

The extension to annotated trail-related information introduces four new properties namely `odta:typeOfTrail`, `odta:startLocation`, `odta:endLocation` and `odta:wayPoint`. All four properties are optional in the DS and the ranges are localized text or `schema:Place` accordingly.

The proposed non-schema.org properties and their ranges can be found in the table below:

PROPERTY	CARDINALITY	RANGE TYPES
<code>odta:typeOfTrail</code>	0 +	Localized Text
<code>odta:startLocation</code>	0 +	Place
<code>odta:endLocation</code>	0 +	Place
<code>odta:wayPoint</code>	0 +	Place ItemList

Table 2: First-level non-schema.org properties of the proposed DS

The extension in N-Triple syntax can be found in Listing 2.

```
<https://odta.io/voc/Trail> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.w3.org/2000/01/rdf-schema#Class> .
<https://odta.io/voc/Trail> <http://www.w3.org/2000/01/rdf-schema#comment> "A path, track or
unpaved lane or road for sport activities or walking."@en .
<https://odta.io/voc/Trail> <http://www.w3.org/2000/01/rdf-schema#label> "Trail"@en .
<https://odta.io/voc/Trail> <http://www.w3.org/2000/01/rdf-schema#subClassOf>
<https://schema.org/Place> .
<https://odta.io/voc/endLocation> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#Property> .
<https://odta.io/voc/endLocation> <http://www.w3.org/2000/01/rdf-schema#comment> "A sub
property of schema.org location. The end location of the trail."@en .
<https://odta.io/voc/endLocation> <http://www.w3.org/2000/01/rdf-schema#label>
"endLocation"@en .
<https://odta.io/voc/endLocation> <http://www.w3.org/2000/01/rdf-schema#subPropertyOf>
<https://schema.org/location> .
<https://odta.io/voc/endLocation> <https://schema.org/domainIncludes>
<https://odta.io/voc/Trail> .
<https://odta.io/voc/endLocation> <https://schema.org/rangeIncludes>
<https://schema.org/Place> .
<https://odta.io/voc/startLocation> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#Property> .
<https://odta.io/voc/startLocation> <http://www.w3.org/2000/01/rdf-schema#comment> "A sub
property of schema.org location. The start location of the trail."@en .
<https://odta.io/voc/startLocation> <http://www.w3.org/2000/01/rdf-schema#label>
"startLocation"@en .
<https://odta.io/voc/startLocation> <http://www.w3.org/2000/01/rdf-schema#subPropertyOf>
<https://schema.org/location> .
<https://odta.io/voc/startLocation> <https://schema.org/domainIncludes>
<https://odta.io/voc/Trail> .
<https://odta.io/voc/startLocation> <https://schema.org/rangeIncludes>
```

```

<https://schema.org/Place> .
<https://odta.io/voc/typeOfTrail> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#Property> .
<https://odta.io/voc/typeOfTrail> <http://www.w3.org/2000/01/rdf-schema#comment> "The type
of a trail."@en .
<https://odta.io/voc/typeOfTrail> <http://www.w3.org/2000/01/rdf-schema#label>
"typeOfTrail"@en .
<https://odta.io/voc/typeOfTrail> <https://schema.org/domainIncludes>
<https://odta.io/voc/Trail> .
<https://odta.io/voc/typeOfTrail> <https://schema.org/rangeIncludes> <https://schema.org/Text>
.
<https://odta.io/voc/wayPoint> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#Property> .
<https://odta.io/voc/wayPoint> <http://www.w3.org/2000/01/rdf-schema#comment> "A
waypoint is an intermediate point or place or stopping point on a trail or line of travel."@en .
<https://odta.io/voc/wayPoint> <http://www.w3.org/2000/01/rdf-schema#label> "wayPoint"@en
.
<https://odta.io/voc/wayPoint> <https://schema.org/domainIncludes> <https://odta.io/voc/Trail>
.
<https://odta.io/voc/wayPoint> <https://schema.org/rangeIncludes>
<https://schema.org/ItemList> .
<https://odta.io/voc/wayPoint> <https://schema.org/rangeIncludes> <https://schema.org/Place> .

```

Listing 2: schema:Place's extension odta:Trail in N-Triples Syntax.

For an example of how a **trail** including a CC-0 license can be annotated see Listing 3:

```

{
  "@context": {
    "rdfs": "http://www.w3.org/2000/01/rdf-schema#",
    "rdf": "http://www.w3.org/1999/02/22-rdf-syntax-ns#",
    "schema": "https://schema.org/",
    "xsd": "http://www.w3.org/2001/XMLSchema#",
    "odta": "https://odta.io/voc/",
    "ds": "https://vocab.sti2.at/ds/"
  },
  "@graph": [
    {
      "@type": [
        "odta:Trail"
      ],
      "schema:name": [
        {
          "@language": "de",
          "@value": "Nordkettentrail"
        }
      ],
      "schema:description": [
        {
          "@language": "de",
          "@value": "Nur für geübte!"
        }
      ]
    }
  ]
}

```

```

    }
  ],
  "odta:typeOfTrail": [
    {
      "@language": "en",
      "@value": "MTB Single Trail"
    }
  ],
  "odta:startLocation": [
    {
      "@type": [
        "schema:Place"
      ],
      "schema:name": [
        {
          "@type": "xsd:string",
          "@value": "Seegrube"
        }
      ]
    }
  ],
  "odta:endLocation": [
    {
      "@type": [
        "schema:Place"
      ],
      "schema:name": [
        {
          "@type": "xsd:string",
          "@value": "Hungerburg"
        }
      ]
    }
  ],
  "odta:wayPoint": [
    {
      "@type": [
        "schema:Place"
      ],
      "schema:name": [
        {
          "@type": "xsd:string",
          "@value": "Umbrüggler Alm"
        }
      ]
    }
  ],
  {
    "@type": [
      "schema:Place"
    ],
    "schema:name": [

```

```

    {
      "@type": "xsd:string",
      "@value": "Arzler Alm"
    }
  ]
}
],
"schema:geo": [
  {
    "@type": [
      "schema:GeoCoordinates"
    ],
    "schema:longitude": [
      {
        "@type": "schema:Number",
        "@value": "47.18"
      }
    ],
    "schema:latitude": [
      {
        "@type": "schema:Number",
        "@value": "11.22"
      }
    ]
  }
],
"schema:sdLicense": [
  {
    "@type": "schema:URL",
    "@value": "https://creativecommons.org/publicdomain/zero/1.0/"
  }
],
"ds:compliesWith": {
  "@id": "https://semantify.it/ds/nBTyKDsKX"
}
]
}

```

Listing 3: A trail validly annotated according to the proposed DS under consideration of the new schema:sdLicense property and the odta:Trail properties.