

Workgroup: ASDF WG
Internet-Draft:
draft-bormann-asdf-sdftype-link-00
Published: 1 December 2022
Intended Status: Standards Track
Expires: 4 June 2023
Authors: C. Bormann
Universität Bremen TZI
An sdftype for Links

Abstract

This document defines and registers an sdftype "link" for the Semantic Definition Format (SDF) for Data and Interactions of Things (draft-ietf-asdf-sdf-12.txt).

About This Document

This note is to be removed before publishing as an RFC.

Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-bormann-asdf-sdftype-link/>.

Discussion of this document takes place on the A Semantic Definition Format for Data and Interactions of Things Working Group mailing list (<mailto:asdf@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/asdf/>. Subscribe at <https://www.ietf.org/mailman/listinfo/asdf/>.

Source for this draft and an issue tracker can be found at <https://github.com/cabo/sdftype-link>.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on 4 June 2023.

Copyright Notice

Copyright (c) 2022 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Revised BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Revised BSD License.

Table of Contents

- [1. Introduction](#)
 - [1.1. Conventions and Definitions](#)
- [2. The sdfType "link"](#)
- [3. Discussion](#)
- [4. Security Considerations](#)
- [5. IANA Considerations](#)
- [6. References](#)
 - [6.1. Normative References](#)
 - [6.2. Informative References](#)
- [Acknowledgments](#)
- [Author's Address](#)

1. Introduction

The Semantic Definition Format for Data and Interactions of Things (SDF, [[I-D.ietf-asdf-sdf](#)]) is a format for domain experts to use in the creation and maintenance of data and interaction models in the Internet of Things.

A common data type that occurs in the modeling of IoT devices is the *link*. [[RFC8288](#)] defines the concept of Web Linking, which complements the target URI that any link will contain, with additional parameters, such as the "link relation type" that explains the relationship expressed by the link, as well as "target attributes" that provide additional information about the target of the link (without a need to "dereference", i.e., follow, the link).

This document defines and registers an sdfType "link" for the Semantic Definition Format. This type models an abstract "serialization" [[RFC8288](#)] of a link, in a way that is compatible with the way SDF maps information models to its data modeling language.

1.1. Conventions and Definitions

The definitions of [[RFC6690](#)], [[RFC8288](#)], and [[I-D.ietf-asdf-sdf](#)] apply.

2. The sdfType "link"

The sdfType "link" is intended to be used with the SDF "type" of "object". The members of that object are strings that are named the same as the link parameter (attribute) names. The special parameter name "href" is used to express the link target. (Parameter names specific to the Constrained RESTful Environment (CoRE) are also discussed in [[I-D.bormann-core-target-attr](#)].)

An example for the instance of a link is provided in [Section 5](#) of [[RFC6690](#)]:

```
</sensors/temp>;rt="temperature-c";if="sensor",
```

An sdfProperty that is used to describe an SDF affordance that is intended to hold a link like this (without getting specific on the actual link to the link target) could look like:

```
{
  "sdfProperty": {
    "temp-c-link": {
      "type": "object",
      "sdfType": "link",
      "properties": {
        "href": { "type": "string"},
        "rt": { "type": "string", "const": "temperature-c"},
        "if": { "type": "string", "const": "sensor"}
      }
    }
  }
}
```

3. Discussion

Links play an important role in SDF modeling both during definition time (for adding information to a model, as e.g., in sdfRef) and during run time (for making links to instances into a subject of data and interaction modeling). The present document is an early attempt at addressing the run-time usage of links, in particular links that fit the Web Linking [[RFC8288](#)] abstractions. A related draft [[I-D.laari-asdf-relations](#)] addresses definition-time links,

but does seem to touch modeling run-time use of links as well (e.g., by discussing "writable" link relations).

Not all links used in ecosystems are based on URIs. E.g., OMA has "object links", which are pairs of numbers (object/instance). These ecosystem links may have some structure that should be modeled in the SDF model (e.g., where the object id part of a link always has to have a specific value). This structure can be mapped into URI strings using some convention, e.g., an OMA object link could be oma-object:3303:0 (where oma-object is placeholder for a URI scheme to be defined). However, burying structural components of the ecosystem-specific link in a string syntax makes it hard to access and control those components from the model.

Examples are needed to show how the OCF collection pattern is addressed by the current specification.

4. Security Considerations

The security considerations of [RFC8288] apply in a general way, although modeling a link as a datatype does not incur all of the security considerations that will apply to actually interchanging these links.

(TODO)

5. IANA Considerations

TODO: This document registers the sdfType "link" in the SDF sdfType registry (which is to be defined in the SDF specification).

6. References

6.1. Normative References

[I-D.ietf-asdf-sdf] Koster, M. and C. Bormann, "Semantic Definition Format (SDF) for Data and Interactions of Things", Work in Progress, Internet-Draft, draft-ietf-asdf-sdf-12, 30 June 2022, <<https://www.ietf.org/archive/id/draft-ietf-asdf-sdf-12.txt>>.

[RFC8288] Nottingham, M., "Web Linking", RFC 8288, DOI 10.17487/RFC8288, October 2017, <<https://www.rfc-editor.org/info/rfc8288>>.

6.2. Informative References

[I-D.bormann-core-target-attr] Bormann, C., "CoRE Target Attribute Registry", Work in Progress, Internet-Draft, draft-bormann-core-target-

attr-01, 6 November 2022, <<https://www.ietf.org/archive/id/draft-bormann-core-target-attr-01.txt>>.

[I-D.laari-asdf-relations]

Laari, P., "Extended relation information for Semantic Definition Format (SDF)", Work in Progress, Internet-Draft, draft-laari-asdf-relations-00, 3 June 2022, <<https://www.ietf.org/archive/id/draft-laari-asdf-relations-00.txt>>.

[RFC6690] Shelby, Z., "Constrained RESTful Environments (CoRE) Link Format", RFC 6690, DOI 10.17487/RFC6690, August 2012, <<https://www.rfc-editor.org/info/rfc6690>>.

Acknowledgments

Discussions in the OneDM liaison organization shaped this proposal.

Author's Address

Carsten Bormann
Universität Bremen TZI
Postfach 330440
D-28359 Bremen
Germany

Phone: [+49-421-218-63921](tel:+49-421-218-63921)
Email: cabo@tzi.org