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CDDL models for some existing RFCs

Abstract

A number of CBOR- and JSON-based protocols have been defined before CDDL was standardized or widely used.

This short draft records some CDDL definitions for such protocols, which could become part of a library of CDDL definitions available for use in CDDL2 processors. It focuses on CDDL in (almost) published IETF RFCs.

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1. Introduction

(Please see abstract.) Add in [STD94] [STD90] [RFC8610] [RFC9165] [I-D.bormann-cbor-cddl-more-control]

2. CDDL definitions for (almost) published RFCs

This section is intended to have one subsection for each CDDL data model presented for an existing RFC. As a start, it is fleshed out with three such data models.

2.1. RFC 7071

Appendix H of [RFC8610] contains two CDDL definitions for [RFC7071], which are not copied here. Typically, the compact form would be used in applications using the RFC 7071 format; while the extended form might be useful to cherry-pick features of RFC 7071 into another protocol.

2.2. RFC 8366

[RFC8366] defines a data model for a "Voucher Artifact", which can be represented in CDDL as:

```
voucher-artifact = {
  "ietf-voucher:voucher": {
    created-on: yang$date-and-time
    ? (
        expires-on: yang$date-and-time
        ? last-renewal-date: yang$date-and-time
        //
        nonce: json-binary<bytes .size (8..32)>
      )
    assertion: assertion
    serial-number: text
    ? idevid-issuer: json-binary<bytes>
    pinned-domain-cert: json-binary<bytes>
    ? domain-cert-revocation-checks: bool
  }
}

assertion = "verified" / "logged" / "proximity"

yang$date-and-time = text .regexp cat3<"[0-9]{4}-[0-9]{2}-[0-9]{2}T",
                            "[0-9]{2}:[0-9]{2}:[0-9]{2}([.][0-9]+)?",
                            "(Z|[+-][0-9]{2}:[0-9]{2})">

cat3<A,B,C> = (A .cat B) .cat C

json-binary<T> = text .b64c T
```

The two examples in the RFC can be validated with this little patchup script:

```
sed -e s/ue=/uQ=/ -e s/'"true"'/true/ | cddl rfc8366.cddl vp -
```

2.3. 7807bis

The RFC to be published out of [_7807bis] defines a simple data model that is reproduced in CDDL here:

```
problem-object = {
  ? type: ~uri
  ? title: text
  ? status: 100..599
  ? detail: text
  ? instance: ~uri
  * (text .regexp "\\*.*")
    .feature "standard-problem-object-extension" => any
  * text .feature "problem-object-extension" => any
}
```

Note that Appendix B of [RFC9290] also defines a CBOR-specific data model that may be useful for tunneling [RFC7807] problem details in [RFC9290] Concise Problem Details.

2.4. YANG-SID

The RFC to be published out of [YANG-SID] defines a data model for a "SID file" in YANG, to be transported as a YANG-JSON instance.

An equivalent CDDL data model is given here:

```
sid-file = {
  "ietf-sid-file:sid-file": {
    module-name: yang$yang-identifier
    ? module-revision: revision-identifier
    ? sid-file-version: sid-file-version-identifier
    ? sid-file-status: "unpublished" / "published"
    ? description: text
    ? dependency-revision: [* dependency-revision]
    ? assignment-range: [* assignment-range]
    ? item: [*item]
  }
}

rep<RE>=cat3<"(", RE, ")*">
opt<RE>=cat3<"(", RE, ")?">
cat3<A,B,C> = (A .cat B) .cat C

id-re = "[a-zA-Z_][a-zA-Z0-9\\-_.]*"
yang$yang-identifier = text .regexp id-re
revision-identifier = text .regexp "[0-9]{4}-[0-9]{2}-[0-9]{2}"
sid-file-version-identifier = uint .size 4
sid = text .decimal (0..9223372036854775807)
plus-id<Prefix> = Prefix .cat id-re
schema-node-re = cat3<plus-id<"/">, plus-id<":">, ; qualified
                      rep<plus-id<"/"> .cat       ; optionally
                          opt<plus-id<":">> > >     ; qualified
schema-node-path = text .regexp schema-node-re

dependency-revision = {
  module-name: yang$yang-identifier
  module-revision: revision-identifier
}

assignment-range = {
  entry-point: sid
  size: sid
}

item = {
  ? status: "stable" / "unstable" / "obsolete"
  (
    namespace: "module" / "identity" / "feature"
    identifier: yang$yang-identifier
  //
    namespace: "data"
    identifier: schema-node-path
  )
  sid: sid
}
```

2.5. Your favorite RFC here...

3. IANA Considerations

This document makes no requests of IANA.

4. Security considerations

The security considerations of [RFC8610], [RFC9165], [I-D.bormann-cbor-cddl-more-control], [STD94] and [STD90] apply. This collection of CDDL models is not thought to create new security considerations. Errors in the models could -- if we knew of them, we'd fix those errors instead of explaining their security consequences in this section.

5. References

5.1. Normative References

[I-D.bormann-cbor-cddl-more-control]
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[RFC8610] Birkholz, H., Vigano, C., and C. Bormann, "Concise Data Definition Language (CDDL): A Notational Convention to Express Concise Binary Object Representation (CBOR) and JSON Data Structures", RFC 8610, DOI 10.17487/RFC8610, June 2019, <https://www.rfc-editor.org/rfc/rfc8610>.

[RFC9165] Bormann, C., "Additional Control Operators for the Concise Data Definition Language (CDDL)", RFC 9165, DOI 10.17487/RFC9165, December 2021, <https://www.rfc-editor.org/rfc/rfc9165>.

[STD90] Bray, T., Ed., "The JavaScript Object Notation (JSON) Data Interchange Format", STD 90, RFC 8259, DOI 10.17487/RFC8259, December 2017, <https://www.rfc-editor.org/rfc/rfc8259>.

[STD94] Bormann, C. and P. Hoffman, "Concise Binary Object Representation (CBOR)", STD 94, RFC 8949, DOI 10.17487/RFC8949, December 2020, <https://www.rfc-editor.org/rfc/rfc8949>.

5.2. Informative References

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