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Additional Application Extensions for the CBOR Extended Diagnostic
Notation (EDN)
draft-bormann-cbor-edn-app-ext-00

Abstract

The CBOR Extended Diagnostic Notation (EDN), to be standardized in draft-ietf-cbor-edn-literals, provides "application extensions" as its main language extension point.

A number of application extensions are already defined in draft-ietf-cbor-edn-literals itself and in draft-ietf-cbor-edn-e-ref. The present document defines a number of additional application extensions that have been batched up as a next step after completing these specifications. (
// Chore: Briefly List extensions.)

// This -00 of an individual submission shows the approximate shape
// the first "batch" of application extensions could have, plus a
// number of registrations that could go into this batch. The latter
// provides a basis for a technical discussion of those
// registrations.

About This Document

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

The latest revision of this draft can be found at <https://cabo.github.io/edn-app-ext/>. Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-bormann-cbor-edn-app-ext/>.

Discussion of this document takes place on the cbor Working Group mailing list (<mailto:cbor@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/cbor/>. Subscribe at <https://www.ietf.org/mailman/listinfo/cbor/>.

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

Status of This Memo

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

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Table of Contents

1. Introduction	3
1.1. Conventions and Terminology	3
2. Application Extensions	4
2.1. same: multiple literals to be checked against each other	4
2.2. bytes: Reinterpret text string as byte string	4
2.3. float: IEEE754-oriented literals for more floating point values	5
2.4. tbd b32/h32/c32?: Create byte string from base32 representation	5
2.5. tbd b45: Create byte string from base45 representation	5
3. Implementation Status	5
3.1. Implementation 1	6
3.2. Implementation 2	6
4. Security considerations	6

5. IANA considerations	6
6. References	7
6.1. Normative References	7
6.2. Informative References	8
Acknowledgements	8
Author's Address	8

1. Introduction

(See abstract.)

Name	Purpose
same	Multiple literals for the same item, to be checked against each other
bytes	Reinterpret text string as byte string
float	Provide IEEE754-oriented literals for more floating point values
tbd b32/h32/c32?	Create byte string from base32 representation, possibly beyond the two variants defined in [RFC4648]
tbd b45	Create byte string from base45 representation [RFC9285]

Table 1: Additional EDN application extensions defined in this document

// Discuss: We should also add application extensions for text generation from bytes, such as b64c and b64u, along the lines of [RFC9741].

1.1. Conventions and Terminology

This specification uses terminology from [I-D.ietf-cbor-edn-literals]. In particular, with respect to control operators, "target" refers to the left-hand side operand, and "controller" to the right-hand side operand. "Tool" refers to tools that produce, consume, or otherwise process EDN. Note also that the data model underlying CBOR provides for text strings as well as byte strings as two separate types, which are then collectively referred

to as "strings".

The term ABNF in this specification stands for the combination of [STD68] and [RFC7405], i.e., ABNF defined in this document allows use of the case-sensitive extensions defined in [RFC7405].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP14] (RFC2119) (RFC8174) when, and only when, they appear in all capitals, as shown here.

2. Application Extensions

2.1. same: multiple literals to be checked against each other

The "same" application extension receives a sequence of one or more data items and throws an error if these data items are not the same.

Example:

```
===== NOTE: '\ ' line wrapping per RFC 8792 =====
$ edn-abnf -afloat,same -e "same<< float'47110815', 37128.08203125, \
                                0x1.22102ap+15 >>"
37128.08203125
$ edn-abnf -afloat,same -e "same<< float'47110815', 37128.08203126 >\
                                >"
** cbor-diagnostic: same<<>>: 37128.08203125 not same as 37128.\
                                08203126: Argument Error
$ edn-abnf -asame -e "same<< h'a10101', <<{/alg/ 1: 1 /AES-GCM 128 /\
                                }>> >>"
h'A10101'
$ edn-abnf -asame -e "same<<1>>" # trivially true
1
```

2.2. bytes: Reinterpret text string as byte string

The "bytes" application extension receives a sequence of zero or more strings (throwing an error if any of these data items are not text or byte strings), concatenates their byte content and yields the concatenation as a byte string.

Examples:

```
$ edn-abnf -abytes -e 'bytes<<>>'
h''
$ edn-abnf -abytes -e 'bytes`text1`'
h'7465787431'
$ edn-abnf -abytes -e 'bytes<<"1", "2">>'
h'3132'
$ edn-abnf -abytes -e 'bytes<<"辰", h'''2f'''>>'
h'C3A42F'
$ edn-abnf -abytes -e 'bytes<<"辰", h'''2f'''>>' | diag2diag.rb -tu
'辰/'
```

2.3. float: IEEE754-oriented literals for more floating point values

The "float" application extension enables the notation of 2-byte, 4-byte, and 8-byte byte strings as hex literals (like the h application prefix). The application-oriented literal is interpreted as an encoded data item prefixing the byte string by a single byte 0xF9 (binary16), 0xFA (binary32), and 0xFB (binary64), respectively, would be.

Example:

===== NOTE: '\ ' line wrapping per RFC 8792 =====

```
$ edn-abnf -afloat -e "[float'fe00', float'47110815']" -tpretty
82          # array(2)
  F9 FE00    # primitive(65024)
  FA 47110815 # primitive(1192298517)
$ edn-abnf -afloat,same -e "same<< float'47110815', 37128.08203125 >\
>"
37128.08203125
```

2.4. tbd b32/h32/c32?: Create byte string from base32 representation

// TO BE DONE: define, possibly beyond the two variants defined in [RFC4648]; watch [I-D.josefsson-rfc4648bis].

2.5. tbd b45: Create byte string from base45 representation

// TO BE DONE: define based on [RFC9285]

3. Implementation Status

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

This section records the status of known implementations of the protocol defined by this specification at the time of posting of this Internet-Draft, and is based on a proposal described in [RFC7942]. The description of implementations in this section is intended to assist the IETF in its decision processes in progressing drafts to RFCs. Please note that the listing of any individual implementation here does not imply endorsement by the IETF. Furthermore, no effort has been spent to verify the information presented here that was supplied by IETF contributors. This is not intended as, and must not be construed to be, a catalog of available implementations or their features. Readers are advised to note that other implementations may exist.

According to [RFC7942], "this will allow reviewers and working groups to assign due consideration to documents that have the benefit of running code, which may serve as evidence of valuable experimentation and feedback that have made the implemented protocols more mature. It is up to the individual working groups to use this information as they see fit".

3.1. Implementation 1

The "float" application extension is implemented in <https://cbor.me> and can be enabled (afloat) in the cbor diagnostic tools (cbor-diag gem) and the edn-abnf gem. At the time of writing, the "same" and "bytes" application extensions (asame, abytes) are only available in the gems.

3.2. Implementation 2

The float application extension is implemented in the JavaScript tools that come with the CBOR test vectors project <https://github.com/cbor-wg/cbor-test-vectors/blob/main/check/files.test.js>.

4. Security considerations

The security considerations of [I-D.ietf-cbor-edn-literals] apply.

// TO BE DONE: List any specific security considerations that apply to specific application extensions.

5. IANA considerations

// TO BE DONE:

6. References

6.1. Normative References

- [BCP14] Best Current Practice 14,
<<https://www.rfc-editor.org/info/bcp14>>.
At the time of writing, this BCP comprises the following:
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<<https://www.rfc-editor.org/rfc/rfc7405>>.

- [RFC9285] Fltstrm, P., Ljunggren, F., and D.W. van Gulik, "The Base45 Data Encoding", RFC 9285, DOI 10.17487/RFC9285, August 2022, <<https://www.rfc-editor.org/rfc/rfc9285>>.
- [RFC9741] Bormann, C., "Concise Data Definition Language (CDDL): Additional Control Operators for the Conversion and Processing of Text", RFC 9741, DOI 10.17487/RFC9741, March 2025, <<https://www.rfc-editor.org/rfc/rfc9741>>.
- [STD68] Internet Standard 68,
<<https://www.rfc-editor.org/info/std68>>.
At the time of writing, this STD comprises the following:
- Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, DOI 10.17487/RFC5234, January 2008, <<https://www.rfc-editor.org/info/rfc5234>>.

6.2. Informative References

- [RFC7942] Sheffer, Y. and A. Farrel, "Improving Awareness of Running Code: The Implementation Status Section", BCP 205, RFC 7942, DOI 10.17487/RFC7942, July 2016, <<https://www.rfc-editor.org/rfc/rfc7942>>.

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